Bid Documents

Montello Street at Route 58 Re-alignment

Town of Carver, Massachusetts

Bid & Contract Documents

Prepared for **Town of Carver**
Carver, Massachusetts

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Watertown, Massachusetts

July 21, 2021

TOWN OF CARVER, MASSACHUSETTS
MONTELLO STREET AT ROUTE 58 RE-ALIGNMENT

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Invitation for Bid

INVITATION FOR BID

MONTELLO STREET AT ROUTE 58 RE-ALIGNMENT

Sealed bids for construction of the Montello Street at Route 58 Re-alignment project will be received at the Office of the Town Administrator, Carver Town Hall, 108 Main Street, Carver, MA 02330 until the time specified below at which time the bids will be publicly opened and read.

Specifications and bid forms may be obtained from www.accentblueprints.com by creating a free account. Specifications and bid forms are free to download. Printed copies are available for a fee.

Bids will be opened in the Carver Town Hall, 108 Main Street, Carver, MA 02330, Meeting Room #1, second floor, on **Monday August 23, 2021 at 10:00am**.

All bids are to be sealed and delivered to the Carver Town Hall Town Administrator, Richard LaFond, 108 Main Street, Carver, MA 02330 and must be plainly marked on the outside of the mailing envelope and printed in bold letters "**MONTELLO STREET BID**." Bids must be received in the Town Administrator's Office no later than **Monday August 23, 2021 at 9:45am** according to the clock located on the wall of the Town Administrator's main office.

A bid summary will be available within seventy-two (72) hours of the bid opening. All bidding procedures will be in accordance with the Massachusetts General Laws Chapter 30, Section 39M inclusive as amended.

There will be an on-site pre-bid meeting held two weeks prior to the bid opening. The pre-bid meeting will take place on **Thursday August 5, 2021 at 2:30pm**.

All bids for this project are subject to applicable public bidding laws of Massachusetts, including, but not limited to G.L. c.30, §39M.

Attention is directed to the minimum wage rates to be paid as determined by the Commissioner of Labor and Workforce Development and the weekly payroll record submittal requirements under the provisions of Massachusetts General Laws, Chapter 149, Section 26 through 27D inclusive.

Selection of the Contractor will be based upon bidder qualifications, including evidence of past performance in similar projects, and bid price. The Contract will be awarded to the bidder deemed by the awarding authority to be the lowest responsible and eligible bidder.

The bidder agrees that its bid shall be good and may not be withdrawn for a period of 30 days, Saturdays, Sundays, and legal holidays excluded, after the opening of the bids.

The Town reserves the right to waive any informalities, to accept or reject, in whole or in part any or all bids, or take whatever other action may be deemed to be in the best interest of the Town.

The work under the base Contract consists of furnishing all labor, materials, and equipment required for re-aligning Montello Street at its intersection with Route 58 (Main Street) in the Town of Carver, Massachusetts and installing a new water line within the re-aligned road. There are two add alternates for the project. Add Alternate #1 consists of pavement reclamation and full depth roadway reconstruction on an additional 700' length of Montello Street and Add Alternate #2 consists of installation of an additional 700' of water line on the same section of Montello Street.

The work under the base Contract includes full depth roadway construction, pavement reclamation, pavement mill and overlay, 12" water line installation, traffic signal installation, culvert replacement, drainage system upgrades, grading, drainage swales and basins, granite curb, HMA berm, HMA driveway aprons, pavement markings, installation of roadway signs, loam and seed, and other miscellaneous items of work.

The work under Add Alternate #1 includes additional pavement reclamation, full depth roadway reconstruction, and HMA driveway aprons on Montello Street.

The work under Add Alternate #2 includes installation of an additional length of 12" water line on Montello Street.

The Contractor must substantially complete all work by **June 15, 2022**.

The Project value is estimated to be $3,200,000. Prevailing Wages, as determined under M.G.L. c. 149, § 26-27H shall apply on this project. Materials, equipment, and supplies used on this project are exempt from sales tax to the extent provided by M.G.L. c. 64H, § 6(f). The Project is expected to commence on or about **September 1, 2021** and be completed no later than **June 15, 2022.**

To obtain copies of the Bid Documents, Plans, and Specifications go to www.accentblueprints.com and create an account. The project will be listed as Montello Street at Route 58 Re-alignment under the Town of Carver. Downloading plans and specifications is free. You will be charged if you require prints.

Bidders shall be pre-qualified by the Massachusetts Department of Transportation in Highway Construction up to the estimated Contract value of $3,200,000. Information on MassDOT Prequalification can be found at: https://www.mass.gov/prequalification-of-horizontal-construction-firms

Bid Deposits shall be submitted in the amount of 5% of the bid price including any alternates. The Bid Deposit shall be made payable to the Town of Carver in the form of a bid bond issued by a surety licensed to do business in the Commonwealth of Massachusetts and shall be conditioned upon the faithful performance by the principal of the agreement contained in the bid. The Town of Carver reserves the right to reject or approve a surety. The Bid Deposits of the

three (3) lowest responsible and eligible bidders shall be retained until the execution and delivery of the Contract.

The contract will be awarded to the bidder deemed by the Town of Carver to be the lowest responsible and eligible bidder. Selection of the successful bidder will be based upon bidder qualifications, including evidence of past performance on similar projects and bid price. The Contract award is be subject to the availability of funding.

The successful general bidder will be required to furnish a Performance Bond and a Labor and Materials Bond, each of which shall be in the amount equal to fifty percent (50%) of the Contract price.

The Town of Carver reserves the right to reject any bid which, in its judgment, fails to meet the requirements of this Advertisement for Bids or which is incomplete, conditional, or obscure, or which contains additions or irregularities, or in which errors occur in addition to the foregoing. The Town of Carver also reserves the right to reject any and all proposals if it deems such rejection(s) to be in the best interest of the Town. The Town of Carver further reserves the right to waive any minor discrepancies or informalities, to permit a bidder to clarify discrepancies or to conduct discussions with all qualified bidders in any manner necessary to serve the best interests of the Town. Any fees or other expenses of the bidders associated with this Advertisement for Bid process are solely the responsibility of the bidders.

Any bid submitted will be binding for sixty (60) days after the time of bid opening.

All questions and correspondence in connection with this Project should be made via email only to Jim Walsh (jim.walsh@carverma.gov) and John Woods (john.woods@carverma.gov) from the Town of Carver and Wayne Amico (wamico@vhb.com) and Joanna Stowell (jstowell@vhb.com) from VHB.

The Town of Carver is an affirmative action/equal opportunity employer and encourages participation from certified minority and women-owned businesses in this Advertisement for Bid. The successful bidder must ensure that employees and applicants for employment are not discriminated against because of their race, color, religion, sex, national origin, or any other basis prohibited by law.

Each bidder shall visit the site of the proposed work and shall fully acquaint himself with the conditions as they exist and shall also thoroughly examine the contract documents. Failure of bidder to visit the site and acquaint himself with the contract documents shall in no way relieve the bidder from any obligation with respect to his bid.

Instructions to Bidders

INSTRUCTIONS TO BIDDERS

PROJECT DESCRIPTION

The work under the base Contract consists of furnishing all labor, materials, and equipment required for re-aligning Montello Street at its intersection with Route 58 (Main Street) in the Town of Carver, Massachusetts and installing a new water line within the re-aligned road. There are two add alternates for the project. Add Alternate #1 consists of pavement reclamation and full depth roadway reconstruction on an additional 700' length of Montello Street and Add Alternate #2 consists of installation of an additional 700' of water line on the same section of Montello Street.

The work under the base Contract includes full depth roadway construction, pavement reclamation, pavement mill and overlay, 12" water line installation, traffic signal installation, culvert replacement, drainage system upgrades, grading, drainage swales and basins, granite curb, HMA berm, HMA driveway aprons, pavement markings, installation of roadway signs, loam and seed, and other miscellaneous items of work.

The work under Add Alternate #1 includes additional pavement reclamation, full depth roadway reconstruction, and HMA driveway aprons on Montello Street.

The work under Add Alternate #2 includes installation of an additional length of 12" water line on Montello Street.

The Contractor must substantially complete all work by **June 15, 2022**.

All work shall conform to the design plans, specifications, and all current MassDOT standards.

1. GENERAL; DEFINITIONS

a. In accordance with the Advertisement for Bids, a copy of which is bound herewith, the Town of Carver (the "Owner"), invites sealed bids on the separate copies of Bid Forms furnished for that purpose, for construction of Montello Street at Route 58 Re-alignment ("Project"). The "Work" consists of the Project as more specifically described in the contract drawings and specifications and shall include all incidental work necessary or customarily done for the completion of the Project.

b. The Bound-in Bid Forms in the Contract Documents are for continuity and the convenience of bidders and are not to be detached from the Contract Documents, filled out or executed.

c. The following definitions shall apply in these Instructions and in the other Contract Documents, unless otherwise specified.

I. The term "bidding documents" shall include the Advertisement for Bids, these Instructions, the bid forms, bond forms, contract forms and other

Contract Documents bound herewith, and shall include the Drawings, the Specifications, and all Addenda issued prior to receipt of bids.

II. The term "Contract Documents" shall mean the Contract entered into between the Owner and the successful bidder, including all documents enumerated as Contract Documents in the Agreement between Owner and Contractor, and all Modifications (as defined in the Contract) issued after execution of the Contract.

III. The terms "Addenda" and "Addendum" shall mean written documents and/or drawings issued by the Owner prior to execution of the Contract which supplement, modify, correct, explain or interpret the bidding documents.

2. RECEIPT, OPENING AND REJECTION OF BIDS

a. Sealed bids for construction of the Montello Street at Route 58 Re-alignment project will be received at the Office of the Town Administrator, Carver Town Hall, 108 Main Street, Carver, MA 02330 until the time specified below at which time the bids will be publicly opened and read.

Specifications and bid forms may be obtained from www.accentblueprints.com by creating a free account. Specifications and bid forms are free to download. Printed copies are available for a fee.

Bids will be opened in the Carver Town Hall, 108 Main Street, Carver, MA 02330, Meeting Room #1, second floor, on **Monday August 23, 2021 at 10:00am**.

All bids are to be sealed and delivered to the Carver Town Hall Town Administrator, Richard LaFond, 108 Main Street, Carver, MA 02330 and must be plainly marked on the outside of the mailing envelope and printed in bold letters "**MONTELLO STREET BID**." Bids must be received in the Town Administrator's Office no later than **Monday August 23, 2021 at 9:45am** according to the clock located on the wall of the Town Administrator's main office.

A bid summary will be available within seventy-two (72) hours of the bid opening.

There will be an on-site pre-bid meeting held two weeks prior to the bid opening. The pre-bid meeting will take place on **Thursday August 5, 2021 at 2:30pm**.

b. The Owner reserves the right to:

I. reject any proposal which is not accompanied by the required bid deposit or which, in the Owner's judgment, fails to meet the requirements of the Advertisement for Bids, the Instructions or statutory requirements, or

which is incomplete, conditional, or obscure, or which contains additions or irregularities, or in which errors occur in addition to the foregoing;

II. reject any and all proposals if it deems such rejection(s) to be in the best interest of the Owner;

III. consider informal and reject any bid which contains erasures, alterations, additions, errors or irregularities of any kind, or which contains proposed prices for any class or item of work which are, in the judgment of the Town, substantially less or more than the actual cost to complete the Work as that term is defined in the Contract Document; or

IV. notwithstanding its rights under items 2b(i)-(iii) above, waive any minor discrepancies or informalities, to permit a bidder to clarify discrepancies or to conduct discussions with all qualified bidders in any manner necessary to serve the best interests of the Owner.

Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered.

The total dollar amount of each bid will be read, and the three apparent lowest bids will be selected for further consideration. All those present at the bid opening may examine all bids after the bid opening.

All addenda will be sent via email to the list of plan holders from www.accentblueprints.com. All users who have downloaded the Plans and Bid

3. PREPARATION OF BIDS

Each bid must be submitted on the prescribed bid forms, must be signed and accompanied by the Certificate of Non-Collusion form, and all Additional Bid Requirements that are supplied to you in the Proposal Package. The bid shall state the legal name of the bidder and shall be signed in ink by a person or persons legally authorized to bind the bidder to a contract. The name and title of the person or persons signing the bid shall be typed or printed below the signature(s).

All blank spaces for bid prices must be filled in, with ink or typewriter in both words and figures, and all of the foregoing Certifications must be fully completed and executed when submitted. Where required, bid prices for each item on the bid form shall be stated in both words and figures. Where itemized lump sum or unit prices are called for, all such prices shall be provided by the bidder. In the event of a discrepancy between prices written in words and prices written in figures, the written words shall govern.

Each bid must be submitted in a sealed envelope bearing on the outside the name of bidder, his address, and the name and contract number of the project for which the bid is submitted. If the bid is mailed, the bidder shall enclose its sealed bid and bid deposit in an outer envelope addressed as follows:

FROM: [Bidder's name and business address]
RE: **MONTELLO STREET BID**
TO: **Rick LaFond, Town Administrator, Town of Carver**

All bidders are cautioned to allow ample time for transmittal of bids. Bidders are solely responsible for delivery to and receipt by the Owner of bids by the bid deadline. Bids received after the specified time will not be accepted or recognized. The time of receipt will determine the acceptability of mailed bids, regardless of postmark.

4. EMAIL MODIFICATION

Any bidder may modify his bid by email communication at any time prior to the scheduled closing time for receipt of bids provided such email communication is received by the Owner prior to the closing time and, provided further, the Owner is satisfied that a written confirmation of the email modification over the signature of the bidder was mailed prior to the closing time. The email communication should not reveal the bid price but should provide the addition or subtraction or other modifications so that the final prices of terms will not be known by the Owner until the sealed bid is opened. If written confirmation is not received within two (2) business days after the closing time, no consideration will be given to the email modification.

5. QUALIFICATIONS OF BIDDER

All bidders must be prequalified for horizontal construction through MassDOT up to the estimated contract value of $3,200,000 in the Highway Construction class of work. Instructions on the prequalification process can be found here: https://www.mass.gov/prequalification-of-horizontal-construction-firms.

Contractors who are not prequalified in Highway Construction to provide the services listed for the total prequal contract value of $3,200,000, *without documented poor performance issues*, and want to bid, should submit a waiver request at least two (2) weeks prior to the bid opening to allow for time to appeal in the event that a waiver is not granted. Contractors are expected to be able to provide their services for the total contract value including add alternates.

The Contract will be awarded to the lowest bid submitted by a responsible and eligible bidder. As used herein, the term “lowest responsible and eligible bidder” shall mean the following: To be considered “responsible” the bidder shall possess the skill, ability and integrity necessary to faithfully perform the work called for by the Contract, based upon a determination of competent workmanship and financial soundness in accordance with the provisions of M.G.L. Ch. 30 Section 39M. To be considered “eligible” the bidder shall be able to meet all requirements for bidders set forth in M.G.L. Ch. 30, Section 39M and not be debarred from bidding, and shall certify that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work.

The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the Work, and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. Without limitation, the investigation of a bidder

may seek to determine whether the bidder is authorized to do business in the Commonwealth of Massachusetts, has had relevant previous experience, and has available equipment, forces and financial resources adequate to assure the Owner that the Work will be completed in accordance with the Contract Documents. The Owner may contact references, and may consider evidence of problems with past performance, such as defaults, contract terminations, imposition of damages or other failures to perform. The amount of other Work to which the bidder is committed may also be considered. The scope of the Owner's investigation of any particular bidder shall remain within the Owner's discretion.

To assist the Owner in its investigation of bidder qualifications, each bid **must include** the name of the Superintendent who is to be used on this project, and his/her experience. Each bid **must also include** a comprehensive list of:

1. Any and all citations and/or violations issued by regulatory agencies and/or judgments against bidder from a court of law.

2. All assessed penalties or liquidated damages, and the project in which they occurred.

3. Any and all contract terminations.

4. A list of all projects worked on over the past three years.

5. A list of the total number of supervisors and workers intended to be assigned to this Project.

The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. The Owner's decision or judgment on these matters will be final, conclusive, and binding. Conditional bids will not be accepted.

6. CONTRACT AWARD

No award will be made to any bidder who cannot satisfy the Town of Carver that he has sufficient ability and experience in this class of work and sufficient capital and plant to enable him to prosecute and complete the work successfully within the time named. The Town's decision or judgment on these matters will be final, conclusive, and binding.

The Town may make such investigations as it deems necessary, and the bidder shall furnish to the Town, under oath if so required, all such information and data for this purpose as the Town may request.

Each bidder must familiarize himself fully with the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his contract. Insofar as possible the Contractor, in carrying out his work, must employ such methods

or means as will not cause any interruption of or interference with the work of any other Contractor.

The Owner will award the contract to the lowest eligible and responsible bidder within thirty (30) business days, after (i) the opening of bids or (ii) the receipt by the Owner of any approvals necessary from Federal or State agencies in connection with the project, whichever is later. As used herein, the term "lowest responsible and eligible bidder" shall mean the bidder (1) whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work as further described in the Contract Document; (2) who shall certify that he is able to furnish labor that can work in harmony with all elements of labor employed or to be employed in the Work; and (3) who obtains within ten (10) days of the notification of contract award the security required under Section 7 below.

The successful bidder will be notified in writing, by mail or otherwise, that its bid has been accepted and that it has been awarded the Contract. The successful bidder shall execute the Contract and furnish the required bonds, at the offices of the Town if requested, within ten (10) days after presentation of the contract to the bidder or notice to the bidder that the Contract is ready for execution.

The Owner shall not enter into a contract with, and shall not approve as a subcontractor furnishing labor and materials for a part of any work of this contract, a foreign corporation which has not filed with the Owner a certificate of the Secretary of State of the Commonwealth of Massachusetts stating that such corporation has complied with M.G.L. c. 156D and the date of such compliance. The Owner shall report to said Secretary of State and to the Department of Corporations and Taxation of the Commonwealth of Massachusetts any foreign corporation performing any work under this contract or any such subcontract, and any person, other than a corporation, performing work under this contract or any such subcontract, and residing or having a principal place of business outside the Commonwealth of Massachusetts.

7. BID SECURITY

Bid Deposits shall be submitted in the amount of 5% of the bid price including any potential alternates. The Bid Deposit shall be made payable to the Town of Carver in the form of a bid bond issued by a surety licensed to do business in the Commonwealth of Massachusetts and shall be conditioned upon the faithful performance by the principal of the agreement contained in the bid.

All bid deposits, except those of the three lowest responsible and eligible bidders, will be returned within ten (10) business days, after the opening of the general bids. The bid deposits of the three lowest responsible and eligible bidders will be returned upon the execution and delivery of the Contract, or if no award is made, upon the expiration of sixty (60) business days, except that, if any bidder fails to perform his agreement to execute a Contract and furnish a Performance Bond and a Labor and Materials Payment Bond as stated in his bid, his bid deposit shall become the property of the Town of Carver as liquidated damages; provided that the amount of the bid deposit which becomes the property of the Town of Carver shall not, in any event, exceed the difference between his bid price and the bid price of the next lowest responsible and eligible

bidder; and provided further that, in case of death, disability or other unforeseen circumstances affecting the bidder, his bid deposit may be returned.

8. TIME OF COMPLETION

Bidder must agree to commence work on **September 1, 2021** and to substantially complete all work by **June 15, 2022**.

9. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

a. It is the responsibility of each bidder before submitting a bid to (1) examine the Bidding and Contract Documents thoroughly; (2) examine the location of the Project to become familiar with local conditions that may affect cost, progress, performance or furnishing of the work; (3) Consider Federal, State, and local laws, regulations, and ordinance that may affect cost, progress and performance of the Work; 4) Notify the Owner of all apparent conflicts, errors, or discrepancies in the Contract Documents.

b. Before submitting a bid, each bidder will be responsible to make or obtain such explorations, tests, and data concerning physical conditions which may affect cost, progress, performance or furnishing of the Work and which the bidder deems necessary to determine its bid for performing the Work in accordance with the time, price, and the terms and conditions of the Contract Documents. Failure of a bidder to visit the site and acquaint itself with the bidding documents or to attend the pre bid conference, if any, shall in no way relieve the bidder from any obligation with respect to its bid or under the Contract if awarded the bid.

c. Owner may, at a bidder's request, provide each bidder access to the site to conduct such explorations and tests as such bidder deems necessary for submission of a bid.

d. The submission of a bid will constitute a representation by the bidder that the bidder has complied with every requirement of the Specification, that without exception the bid is premised upon performing and furnishing the work required.

e. No claim for any extra monies will be allowed because of unintentional error or conflicts in the Contract Documents.

f. The failure or omission of any bidder to examine any form, instrument, or document and to fail to be familiar and visit the site will not relieve a successful bidder of the obligation to furnish all material, labor and equipment necessary to carry out the provisions of the Contract.

10. ADDENDA AND INTERPRETATIONS

No oral interpretation of the meaning of the plans, specification or other bidding documents will be made to any bidder. Every request for such interpretation shall be made via email only to Jim Walsh (jim.walsh@carverma.gov) and John Woods (john.woods@carverma.gov) from the Town

of Carver and Wayne Amico (wamico@vhb.com) and Joanna Stowell (jstowell@vhb.com) from VHB and, to be given consideration, must be received at least five (5) days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications issued not later than two (2) days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addenda or interpretation shall not relieve such bidder from any obligations under his bid as submitted. All addenda so issued shall become part of the Contract Documents.

11. SECURITY FOR FAITHFUL PERFORMANCE

Simultaneously with his delivery of the executed contract, the Contractor shall furnish a surety bond as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract, as specified in the General Conditions included herein. The surety on such bond or bonds shall be provided by a duly authorized surety company satisfactory to the Owner. The successful general bidder will be required to furnish a Performance Bond and a Labor and Materials Bond, each of which shall be in the amount equal to fifty percent (50%) of the contract price.

12. POWER OF ATTORNEY

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their powers of attorney.

13. NOTICE OF SPECIAL CONDITIONS

Attention is particularly called to those parts of the Contract Documents and specifications, which deal with the following:

a. Inspection and testing of materials

b. Insurance requirements

c. Wage rates

d. Non-discrimination in employment

e. OSHA 10 Certification

14. LAWS AND REGULATIONS

The bidder's attention is directed to the fact that all applicable Federal and State laws, municipal bylaws and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract and the Work throughout, and will be deemed to be included in the Contract the same as though herein written out in full.

The award of the Contract is governed by M.G.L. c. 30, § 39M. Certain provisions of this and other applicable statutes are summarized or referred to in the Instructions to Bidders and other Contract Documents. Whenever any of the Contract Documents set forth or summarize

applicable statutory provisions, whether or not the statutes have been specifically referred to, such summaries are for convenience only, do not purport to be complete or correct as summaries in any material particular, and shall in no respect supersede, expand or limit rights or duties of the Town or bidders in matters governed by statute.

Minimum rates of wages for work performed under this contract will be as determined by the Division of Occupational Safety of the Massachusetts Department of Labor and Work Force Development in accordance with the provisions of M.G.L. c. 149, §§ 26-27H. Attention is called to serious penalties established under law for violation of these provisions. The schedule of wage rate determinations applicable to this contract is included in the bidding documents.

15. PROTECTION AND RESTORATION OF PROPERTY

The Contractor, in constructing or installing facilities alongside or near sewers, drains, water or gas pipes, electric or telephone conduits, poles, sidewalks, walls or other structures shall, at his expense, sustain them securely in place, cooperating with the officers and agents of the various utility companies and municipal departments which control them so that the services of these structures shall be maintained. He shall also be responsible for the repair or replacement, at his own expense, of any damage to such structures caused by his acts or neglect and shall leave them in the same condition as they existed prior to the commencement of work.

In case of damage to utilities, the Contractor shall promptly notify the Owner and shall furnish laborers to work temporarily under the Owner's direction in providing access to the utility. Pipes or other structures damaged by the operation of the Contractor may be repaired by the Town of Carver or by the utility company, which suffers the loss. The cost of such repairs shall be borne by the Contractor without compensation therefore.

It shall be the responsibility of the Contractor to determine location, size, type, etc., of all underground utilities from the Town of Carver, and/or the utility company concerned, and to maintain all utilities in place during construction.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in protecting or repairing property as specified in this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed thereafter.

16. PUBLIC SAFETY AND CONVENIENCE

Attention is directed to the fact that the work on this project is to be performed on properties which are utilized by pedestrians. The Contractor shall furnish, install, maintain, and move all warning devices, barricades, signs, flares, bridging materials, special apparel, and other safety measures and controls necessary for the protection of motorists, of pedestrians, and of his own personnel. When, in the judgment of the Owner, construction operations constitute a hazard to traffic in the area, the Contractor may be required to suspend operations during certain hours.

17. POLICE DETAILS

Uniformed police officers for traffic control shall be paid on an hourly bases using the Carver Police Department invoices and hourly rates. No mark-up or administrative fees will be charged. The Police Department invoices shall include the officer's name, date, location, hours worked, and wage rate. An allowance for police services has been included in all bids.

18. SALES TAX

M.G.L. c. 64H, § 6(f) exempts from Massachusetts sales tax building materials and supplies to be used in the Project, and bidders shall not include in their bids any amount therefor. The words "building materials and supplies" shall include all materials and supplies consumed, employed or expended in the construction, reconstruction, alteration, remodeling or repair of any building, structure, public highway, bridge, or other such public work, as well as such materials and supplies physically incorporated therein. Said words shall also include rental charges for construction vehicles, equipment and machinery rented specifically for use on the site of the Project or while being used exclusively for the transportation of materials for the Project. The number of the certificate granted by the Commissioner of Revenue for use in obtaining the exemption will be given to the successful general bidder. Each bidder shall take this exemption into account in calculating its bid and shall not include any sales tax on its bid.

19. INTEREST OF MEMBERS, OFFICERS, OR EMPLOYEES OF THE OWNER; MEMBERS OF LOCAL GOVERNING BODY, OR OTHER PUBLIC OFFICIALS

No member, officer or employee of Owner, or its designees or agents, no member of the governing body of the locality in which the project is situated, and no other public officials, member, officer or employee of the Owner, or its designees or agents, no members of the governing body of such locality or localities who exercises any functions or responsibilities with respect to the Project during his tenure or for one year thereafter, shall have any interest, direct or indirect, in any agreement, contract or subcontract, or the proceeds thereof, for Work to be performed in connection with the Project. The Contractor shall incorporate or cause to be incorporated, in all of its agreements, contracts or subcontracts a provision prohibiting such interest pursuant to the purposes of this section.

20. NON-DISCRIMINATION IN EMPLOYMENT

Contract for Work under this proposal will obligate the contractors and subcontractors not to discriminate in employment practices.

Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the award of the Contract.

The successful bidder must be prepared to comply in all respects with the Contract provisions regarding Equal Employment Opportunity.

21. SEPARATE CONTRACTS

a. The Owner reserves the right to perform construction or operations related to the Project under separate contracts, and/or with the Owners' own forces in connection with other portions of the Project or other construction or operations on the site under separate Contract.

b. The Contractor shall cooperate fully with separate contractors with regard to storage of materials and execution of separate contract work and shall connect and coordinate the separate contractors' construction and operations with the Contractor's as required by the Contract Documents.

c. It shall be the Contractor's responsibility to inspect all separate contractor work affecting the Work and to report to the Owner any irregularities or defects that will not permit completion of the Work in a satisfactory manner.

d. When results of separate contractors' work depend on proper results for the Contractor's Work, the Contractor shall immediately report to the Owner or Engineer any discrepancies or defects that would be unsuitable for proper execution of the Work.

e. It shall be the responsibility of the Contractor to measure the completed work in place and report to the Owner immediately any difference between completed work by others and the Drawings.

f. The Contractor's failure to notify the Owner of such irregularities shall indicate the separate contractors' work has been satisfactorily completed to receive the Work.

g. The Contractor shall not be responsible for defects in the separate contractors' work of which could not then have been reasonably discovered.

22. ADD ALTERNATES

Should the Owner determine that it would be in its best interest to modify the scope of proposed work, the following items may be added as alternatives to the Contract, increasing the Total Bid.

Add Alternate #1: Pavement reclamation and full depth roadway reconstruction on an additional 700' length of Montello Street.

Add Alternate #2: Installation of an additional 700' of water line on Montello Street.

Each bidder shall acknowledge the add alternate by completing the section entitled "Supplemental Form for General Bid – Add Alternate # 1" and entering the dollar amount of addition or subtraction corresponding to each item. Each Bidder shall enter the sum of the appropriate dollar amounts in the spaces provided.

In the event any items part of the Add Alternate do not involve a change in dollar value, the bidder shall so indicate by inserting “No Change,” “No Charge,” “N/C,” or “0” in the corresponding space provided for the dollar amount of the item.

Add Alternates will be chosen at the discretion of the Town.

The low bidder will be determined on the basis of the sum of the Base Bid and any accepted Add Alternates.

23. ADDITIONAL PROJECT INFORMATION

Compaction and Material Testing: If required by the Engineer or the Town, the Contractor shall engage a certified independent testing company to provide compaction and/or material testing as required. Such materials may include, but are not limited to, gravel, dense graded crushed stone, asphalt courses, and concrete. The Contractor shall engage a certified independent testing company at their own cost and no additional compensation outside the contract items will be considered for payment for these services.

Documents: Construction of the Project will be subject to the Order of Conditions issued by MassDEP (SE# 126-617) and the North Carver Water District Rules and Regulations, both of which are attached to these bid documents.

Bid Forms

FORM OF BID

From: _____
(Name of Bidder)

To: Town of Carver (the "Awarding Authority")

A. The Undersigned proposes to furnish all labor, equipment, tools and materials required for the construction of Montello Street at Route 58 Re-alignment (the "Project"), in accordance with the accompanying Contract Documents and plans and specifications prepared by Vanasse Hangen Brustlin, Inc. for the contract price specified below, subject to additions and deductions according to the terms of the specifications.

B. The bid includes addenda numbered _____
& dated _____.

C. The proposed maximum contract price (including all add alternates) is

_____dollars

($ _____). Bidder hereby confirms that it has included bid security in the amount of 5% of the proposed contract price made payable to the Town of Carver.

D. Bidder accepts all of the terms and conditions of the Advertisement for Bids and Instructions to Bidders.

E. Bidder promises and agrees that this Bid will remain subject to acceptance for sixty (60) business days after the day of Bid Opening.

F. The undersigned agrees that, if selected as contractor, he or she will within ten (10) business days, after presentation thereof by the Awarding Authority, execute a contract in accordance with the terms of this bid and furnish a performance bond and a labor and materials or payment bond, each in the form contained in the bidding documents and of a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the Awarding Authority and each in the amount of the contract price, the premiums for which are to be paid by the contractor and are included in the contract price. The undersigned understands and agrees that the bid deposit accompanying this bid shall become the property of the Awarding Authority if the bidder fails to execute such contract or otherwise fails to comply with the terms of this bid.

G. The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work, and in the specified time described in the bid and contract documents, and that he will comply fully with all laws and regulations applicable to awards made subject to M.G.L. c. 30, § 39M.

H. The undersigned further certifies under the penalties of perjury that:

1. This bid is in all respects bona fide, fair, and made without collusion or fraud with any other person. As used in this paragraph the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

2. The said undersigned is not presently debarred from doing public construction work in the commonwealth under the provisions of M.G.L. c. 29, § 29F, or any other applicable debarment provision or any rule or regulation.

3. Bidder has complied with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

4. The foregoing bid is based upon the payment to laborers to be employed on the Project of wages in an amount no less than the applicable prevailing wage rates established for the Project by the Massachusetts Department of Labor Standards. The undersigned bidder agrees to indemnify the awarding authority for, from, and against any loss, expense, damages, actions, or claims, including any expense incurred in connection with any delay or stoppage of the project work arising out of or as a result of (1) the failure of the said bid to be based upon the payment of the said applicable prevailing wage rates or (2) the failure of the bidder, if selected as the contractor, to pay laborers employed on the project the said applicable prevailing wage rates.

5. The bidder has complied with the Immigration Reform and Control Act of 1986, as amended, and with all regulations adopted thereunder, with respect to all of its employees who will be performing work under this contract and further certifies that said contractor does not knowingly employ any person in violation of United State immigration laws. Bidder further certifies that it will require a similar certification to be executed by any subcontractor who will perform work under this contract and will maintain such certifications for inspection by the Awarding Authority upon its request.

I. By signing and submitting this Form for General Bid, the bidder represents that:

1. Bidder has examined copies of all bidding documents.

2. Bidder has familiarized itself with the nature and extent of the Contract Documents, Work site, locality, and all local conditions and laws and regulations that in any manner may affect cost, progress, performance or furnishing of the work.

3. Bidder has studied carefully all reports and drawings of physical conditions included with these specifications, and accepts that all measurements and technical data included herein is the engineer’s estimates and the bidder has made

such investigations of his own as necessary and has based his bid on those investigations.

4. Bidder has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, and studies (in addition to or which pertain to the physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work) as bidder considers necessary for the performance or furnishing of the Work at the Contract Price, with in the Contract Time and in accordance with the other terms and conditions of the Contract Documents, and no additional examination, investigations, explorations, tests, reports, or similar information of data are or will be required by bidder for such purposes.

5. Bidder has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

6. Bidder has given the Awarding Authority written notice of all conflicts, errors, or discrepancies that it has discovered in the Contract Documents and the written resolution thereof is acceptable to bidder.

7. Bidder acknowledges that the Awarding Authority has the right to reject any or all bids and to waive informalities in the bidding, if it deems such rejection(s) to be in its best interest.

8. Bidder represents that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

J. Post-Bid Submittals: If awarded the Contract, the undersigned agrees to furnish, without limitation, the following information prior to the time established for execution of the Contract:

1. Massachusetts Foreign Corporation Certificate, if applicable.

2. OSHA training records for each employee assigned to this project.

K. References: List of all projects of a similar size and scope completed within the last five (5) years, including at least two municipalities for which such work has been performed. Attach additional pages if necessary.

Name of Project	Location	Contact Person	Phone/Email
1.			
2.			
3.			
4.			

Date of Bid: _____

_____
(Print Name of Bidder)

By: _____
(Signature)

_____
(Print Name of Person Signing Bid and Title)

_____
(Business Address)

_____
(Town, State and Zip Code)

Telephone: ( )_____

Social Security Number or Federal Identification Number: [1]_____

NOTE: If the bidder is a corporation, indicate state of incorporation, give full names of officers; if a partnership, give full names and addresses of all partners; and if an individual, give residential address if different from business address. Use the following spaces, and additional sheets if necessary:

If a Corporation:

Incorporated in what state:_____

President:_____

Treasurer:_____

Secretary:_____

If a foreign corporation (incorporated or organized under laws other than the laws of the Commonwealth of Massachusetts), is the corporation registered with the Secretary of State of Massachusetts?

Yes _____ No _____

[1] The bidder's Social Security Number and Federal Identification Number will be furnished to the Massachusetts Department of Revenue to determine whether the bidder has met tax filing or tax payment obligations. This request is made under the authority of M.G.L. c. 62C, § 49A.

If the bidder is selected for the work referred to above, it is required under M.G.L. c.30 § 39L to furnish to the Awarding Authority a certificate of the Secretary of State stating that the corporation has complied with M.G.L. c. 156D and the date of such compliance.

If a Partnership: (Name all Partners)

Name of Partner:_____

Residence:_____

Name of Partner:_____

Residence:_____

Name of Partner:_____

Residence:_____

If an Individual:

Name:_____

Residence:_____

If an Individual doing business under a firm name:

Name of Firm:_____

Name of Individual:_____

Business Address:_____

Residence:_____

If other form of business organization, please provide attachment describing the form of organization and the name of officers or partners therein.

Supplemental Form for General Bid
Base Bid

Project: Montello at Main Street Intersection Reconfiguration
Location: Carver, Massachusetts

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
101.	2	CLEARING AND GRUBBING at _____ A				
102.1	1,250	TREE TRIMMING at _____ FT				
102.511	10	TREE PROTECTION - ARMORING & PRUNING at _____ EA				
102.521	650	TREE AND PLANT PROTECTION FENCE at _____ FT				
115.1	1	DEMOLITION OF CULVERT at _____ LS				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
120.1	2,600	UNCLASSIFIED EXCAVATION at _____ CY				
140.	460	BRIDGE EXCAVATION at _____ CY				
141.1	50	TEST PIT FOR EXPLORATION at _____ CY				
142.	10	CLASS B TRENCH EXCAVATION at _____ CY				
144.	100	CLASS B ROCK EXCAVATION at _____ CY				
146.	2	DRAINAGE STRUCTURE REMOVED at _____ EA				
150.	90	ORDINARY BORROW at _____ CY				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
151.	1,700	GRAVEL BORROW at _____ CY				
151.01	140	GRAVEL BORROW - TYPE C at _____ CY				
151.1	10	GRAVEL BORROW FOR BRIDGE FOUNDATION at _____ CY				
151.2	580	GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES at _____ CY				
153.	10	CONTROLLED DENSITY FILL - EXCAVATABLE at _____ CY				
156.	50	CRUSHED STONE at _____ TON				
170.	4,700	FINE GRADING AND COMPACTING at _____ SY				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
201.	9	CATCH BASIN at _____ EA				
202.	1	MANHOLE at _____ EA				
203.	1	SPECIAL MANHOLE at _____ EA				
220.	11	DRAINAGE STRUCTURE ADJUSTED at _____ EA				
221.	4	FRAME AND COVER at _____ EA				
222.1	5	FRAME AND GRATE - MASSDOT CASCADE TYPE at _____ EA				
223.2	2	FRAME AND GRATE (OR COVER) REMOVED AND DISCARDED at _____ EA				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
224.12	5	12 INCH HOOD at _____ EA				
235.12	3	12 INCH DRAINAGE PIPE FLARED END - OPTION at _____ EA				
241.12	320	12 INCH REINFORCED CONCRETE PIPE at _____ FT				
258.	60	STONE FOR PIPE ENDS at _____ SY				
280.	10	HOT MIX ASPHALT WATERWAY at _____ SY				
302.06	40	6 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET) at _____ FT				
302.12	650	12 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET) at _____ FT				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
303.12	130	12 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) at _____ FT				
309.	2,500	DUCTILE IRON FITTINGS FOR WATER PIPE at _____ LB				
325.08	20	8 INCH STEEL PIPE CASING FOR WATER PIPE at _____ FT				
325.24	20	24 INCH STEEL PIPE CASING FOR WATER PIPE at _____ FT				
350.06	2	6 INCH GATE AND GATE BOX at _____ EA				
350.12	5	12 INCH GATE AND GATE BOX at _____ EA				
358.	2	GATE BOX ADJUSTED at _____ EA				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
376.	2	HYDRANT at _____ EA				
376.2	1	HYDRANT - REMOVED AND RESET at _____ EA				
402.	500	DENSE GRADED CRUSHED STONE FOR SUB-BASE at _____ CY				
403.	2,600	RECLAIMED PAVEMENT FOR BASE COURSE AND/OR SUB-BASE at _____ SY				
415.1	2,100	PAVEMENT STANDARD MILLING at _____ SY				
431.	210	HIGH EARLY STRENGTH CEMENT CONCRETE BASE COURSE at _____ SY				
440.	26,800	CALCIUM CHLORIDE FOR ROADWAY DUST CONTROL at _____ LB				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
443.	10	WATER FOR ROADWAY DUST CONTROL at _____ MGL				
450.23	720	SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) at _____ TON				
450.31	510	SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5) at _____ TON				
450.32	970	SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) at _____ TON				
451.	20	HMA FOR PATCHING at _____ TON				
452.	700	ASPHALT EMULSION FOR TACK COAT at _____ GAL				
453.	3,400	HMA JOINT SEALANT at _____ FT				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
470.1	1,200	HOT MIX ASPHALT BERM at _____ FT				
472.	75	TEMPORARY ASPHALT PATCHING at _____ TON				
504.2	2	GRANITE CURB TYPE VA4 - SPLAYED END at _____ EA				
506.	930	GRANITE CURB TYPE VB - STRAIGHT at _____ FT				
506.1	140	GRANITE CURB TYPE VB - CURVED at _____ FT				
509.	60	GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - STRAIGHT at _____ FT				
620.12	350	GUARDRAIL, TL-2 (SINGLE FACED) at _____ FT				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
620.13	150	GUARDRAIL, TL-3 (SINGLE FACED) at _____ FT				
620.33	70	GUARDRAIL - CURVED, TL-3 (SINGLE FACED) at _____ FT				
627.1	3	TRAILING ANCHORAGE at _____ EA				
627.82	1	GUARDRAIL TANGENT END TREATMENT, TL-2 at _____ EA				
627.83	1	GUARDRAIL TANGENT END TREATMENT, TL-3 at _____ EA				
627.92	2	GUARDRAIL FLARED END TREATMENT, TL-2 at _____ EA				
630.2	80	GUARDRAIL REMOVED AND DISCARDED at _____ FT				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
697.1	11	SILT SACK at _____ EA				
702.	20	HOT MIX ASPHALT SIDEWALK OR DRIVEWAY at _____ TON				
748.	1	MOBILIZATION at _____ LS				
751.	670	LOAM BORROW at _____ CY				
755.35	1	INLAND WETLAND REPLICATION AREA at _____ LS				
756.	1	NPDES STORMWATER POLLUTION PREVENTION PLAN at _____ LS				
757.1	1	SUBSURFACE GRAVEL WETLAND #1 at _____ LS				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
757.2	1	SUBSURFACE GRAVEL WETLAND #2 at _____ LS				
765.	4,800	SEEDING at _____ SY				
767.121	3,200	SEDIMENT CONTROL BARRIER at _____ FT				
769.	720	PAVEMENT MILLING MULCH UNDER GUARD RAIL at _____ FT				
804.3	350	3 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC -(UL) at _____ FT				
815.1	1	TRAFFIC CONTROL SIGNAL LOCATION NO. 1 at _____ LS				
832.	60	WARNING-REGULATORY AND ROUTE MARKER - ALUM. PANEL (TYPE A) at _____ SF				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
847.1	10	SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY - STEEL at _____ EA				
851.1	90	TRAFFIC CONES FOR TRAFFIC MANAGEMENT at _____ DAY				
852.	570	SAFETY SIGNING FOR TRAFFIC MANAGEMENT at _____ SF				
853.1	5	PORTABLE BREAKAWAY BARRICADE TYPE III at _____ EA				
853.2	250	TEMPORARY BARRIER at _____ FT				
853.21	250	TEMPORARY BARRIER REMOVED AND RESET at _____ FT				
853.52	2	TEMPORARY IMPACT ATTENUATOR UNIDIRECTIONAL, NON-REDIRECTIVE (TL-2) at _____ EA				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
853.8	65	TEMPORARY ILLUMINATION FOR WORK ZONE at _____ DAY				
854.014	7,400	TEMPORARY PAVING MARKINGS - 4 INCH (PAINTED) at _____ FT				
854.034	3,700	TEMPORARY PAVING MARKINGS - 4 INCH (TAPE) at _____ FT				
856.12	75	PORTABLE CHANGEABLE MESSAGE SIGN at _____ DAY				
859.	1,300	REFLECTORIZED DRUM at _____ DAY				
859.1	130	REFLECTORIZED DRUM WITH SEQUENTIAL FLASHING WARNING LIGHTS at _____ DAY				
864.04	350	PAVEMENT ARROWS AND LEGENDS REFL. WHITE (THERMOPLASTIC) at _____ SF				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
866.104	2,800	4 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) at _____ FT				
866.112	100	12 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) at _____ FT				
867.104	3,700	4 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) at _____ FT				
867.112	200	12 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) at _____ FT				
874.	2	STREET NAME SIGN at _____ EA				
874.4	1	TRAFFIC SIGN REMOVED AND STACKED at _____ EA				
904.	20	4000 PSI, 3/4 IN., 610 CEMENT CONCRETE at _____ CY				

Carried Forward: _____ _____

Supplemental Form for General Bid - Base Bid

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
986.	50	MODIFIED ROCKFILL at _____ TON				
991.01	1	CONTROL OF WATER at _____ LS				
995.011	1	CULVERT STRUCTURE at _____ LS				
999.	1	CONSTRUCTION STAKING at _____ LS				
999.1	1	POLICE SERVICES at Fifty-Six Thousand Dollars ALL	56,000	00	56,000	00
999.2	1	AS-BUILT PLANS at _____ LS				

TOTAL BASE BID: _____

(Written in Words):

_____

Supplemental Form for General Bid
Add Alternate #1

Project: Montello at Main Street Intersection Reconfiguration
Location: Carver, Massachusetts

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
102.1	700	TREE TRIMMING at _____ FT				
102.511	2	TREE PROTECTION - ARMORING & PRUNING at _____ EA				
120.1	1,200	UNCLASSIFIED EXCAVATION at _____ CY				
141.1	30	TEST PIT FOR EXPLORATION at _____ CY				
151.	700	GRAVEL BORROW at _____ CY				

Carried Forward: _____ _____

Supplemental Form for General Bid - Add Alternate #1

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
170.	2,500	FINE GRADING AND COMPACTING at _____ SY				
220.	1	DRAINAGE STRUCTURE ADJUSTED at _____ EA				
258.	10	STONE FOR PIPE ENDS at _____ SY				
280.	2	HOT MIX ASPHALT WATERWAY at _____ SY				
402.	300	DENSE GRADED CRUSHED STONE FOR SUB-BASE at _____ CY				
403.	2,600	RECLAIMED PAVEMENT FOR BASE COURSE AND/OR SUB-BASE at _____ SY				
415.1	30	PAVEMENT STANDARD MILLING at _____ SY				

Carried Forward: _____ _____

Supplemental Form for General Bid - Add Alternate #1

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
440.	13,800	CALCIUM CHLORIDE FOR ROADWAY DUST CONTROL at _____ LB				
443.	5	WATER FOR ROADWAY DUST CONTROL at _____ MGL				
450.23	260	SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) at _____ TON				
450.31	250	SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5) at _____ TON				
452.	700	ASPHALT EMULSION FOR TACK COAT at _____ GAL				
453.	3,400	HMA JOINT SEALANT at _____ FT				
697.1	1	SILT SACK at _____ EA				

Carried Forward: _____ _____

Supplemental Form for General Bid - Add Alternate #1

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
702.	50	HOT MIX ASPHALT SIDEWALK OR DRIVEWAY at _____ TON				
715.1	2	MAIL BOX REMOVED AND RESET at _____ EA				
748.	1	MOBILIZATION at _____ LS				
751.	200	LOAM BORROW at _____ CY				
765.	1,500	SEEDING at _____ SY				
767.121	810	SEDIMENT CONTROL BARRIER at _____ FT				
867.104	1,400	4 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) at _____ FT				

Carried Forward: _____ _____

Supplemental Form for General Bid - Add Alternate #1

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
986.	5	MODIFIED ROCKFILL at _____ TON				

TOTAL ADD ALTERNATE #1: _____

(Written in Words):

_____

Supplemental Form for General Bid
Add Alternate #2

Project: Montello at Main Street Intersection Reconfiguration
Location: Carver, Massachusetts

Item Number	Quantity	Item with Unit Bid Price Written in Words	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
302.12	775	12 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET) at _____ FT				
309.	1,150	DUCTILE IRON FITTINGS FOR WATER PIPE at _____ LB				
350.12	1	12 INCH GATE AND GATE BOX at _____ EA				

TOTAL ADD ALTERNATE #2: _____

(Written in Words):

_____

Supplemental Form for General Bid Totals

Project: Montello at Main Street Intersection Reconfiguration
Location: Carver, Massachusetts

TOTAL BASE BID: $ _____

TOTAL ADD ALTERNATE #1: $ _____

TOTAL ADD ALTERNATE #2: $ _____

TOTAL BID:
(BASE + AA1 + AA2) $ _____

(Total Bid Written in Words):

_____

LEGAL CERTIFICATIONS

CERTIFICATIONS REQUIRED BY LAW
FOR PUBLIC CONSTRUCTION CONTRACTS

You must COMPLETE and SIGN the following certifications. You must also print, at the bottom of this page, the name of the contractor for whom these certifications are submitted.

TAX COMPLIANCE

Pursuant to Chapter 62C of the Massachusetts General Laws, Section 49A(b), I, the undersigned, authorized signatory for the below named contractor, do hereby certify under the pains and penalties of perjury that said contractor has complied with all laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

NON-COLLUSION

The undersigned certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

PUBLIC CONTRACTOR DEBARMENT

The undersigned certifies under penalty of perjury that the below named contractor is not presently debarred from doing public construction work in the commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

OSHA TRAINING

Pursuant to G.L. c. 30, §39S, the Contractor hereby certifies under penalties of perjury as follows:

(1) Contractor is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work;
(2) All employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and they shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and
(3) All employees to be employed in the work subject to this contract have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.

COMPLETE AND SIGN BELOW:

_____ _____
Authorized Person's Signature Date

_____
Print Name & Title of Signatory

_____
Name of Contractor

CERTIFICATION

INTERNAL ACCOUNTING

The Contractor certifies that it has internal accounting controls as required by Chapter 30, Section 39R, and that the Contractor will:

1. Maintain accurate and detailed accounts for a six-year period after the final payment;

2. File regular statements of management concerning internal auditing controls;

3. File an annual audited financial statement; and

4. Submit a statement from an independent certified public accountant that such CPA has examined management's internal auditing controls and expresses an opinion as to their consistency with management's statements in (2) above and whether such statements are reasonable with respect to transactions and assets that are substantial in relation to designer's financial statements. G.L. Chapter 7, Section 301(e).

Signed under the pains and penalties of perjury:

Name of Company:_____

Authorized Signature:_____

NOTE: This form is to be completed only when the contract exceeds $100,000 and is for the purchase of materials or for the construction, renovation, etc., of public works or public buildings.

TO: Town of Carver, Massachusetts

RE: Montello Street at Route 58 Re-alignment

To whom it may concern:

Please be advised that I have reviewed the statement on internal accounting controls prepared by/for _____ (name of company), in connection with the above captioned project. This statement is required under Massachusetts General Laws, Chapter 30, Section 39R. In my opinion, representations of management are consistent with our evaluation of the system of internal accounting controls. In addition, I believe that they are reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the firm's financial statements.

Yours sincerely,

_____
Certified Public Accountant

NOTE: This form is to be completed only when the contract exceeds $100,000 and is for the purchase of materials or for the construction, renovation, etc., of public works or public buildings.

Agreement

AGREEMENT

THIS AGREEMENT made this _____ day of _____

in the year Two Thousand and ____, between _____, with a

usual place of business at _____, hereinafter

called the CONTRACTOR, and the Town of Carver, acting by its Town Administrator, with a

usual place of business at 108 Main Street, Carver, MA 02330, hereinafter called the OWNER.

The CONTRACTOR and the OWNER, for the consideration hereinafter named, agree as follows:

1. Scope of Work

The Contractor shall furnish all labor, materials, equipment and insurance to perform all work required for the project known as **Montello Street at Route 58 Re-alignment**, in strict accordance with the Contract Documents and all related Drawings and Specifications. The said Documents, Specifications, Drawings and any GENERAL SUPPLEMENTARY CONDITIONS are incorporated herein by reference and are made a part of this Agreement.

2. Contract Price

The Owner shall pay the Contractor for the performance of this Agreement, subject to additions and deductions provided herein, in current funds, the sum of
_____.

3. Commencement and Completion of Work and Liquidated Damages

It is agreed that time is of the essence of this Agreement. The Contractor shall commence and prosecute the work under this Agreement upon execution hereof and shall complete the work on or before **June 15, 2022**.

A. Definition of Term: The Term "Substantial completion" shall mean the date certified by the Owner when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner may occupy the project, or designated portion(s) thereof, for the use for which it is intended.

B. Time as Essential Condition: It is understood and agreed that the commencement of and substantial completion of the work are essential conditions of this Agreement. It is further agreed that time is of the essence for each and every portion of the Contract Documents wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract Documents any additional time is allowed for the completion of any work, the new time fixed by such extension shall be of

the essence of this Agreement. It is understood and agreed that the times for the completion of the work are reasonable, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

C. Progress and Completion: Contractor shall commence work promptly upon execution of this Agreement and shall prosecute and complete the work regularly, diligently and uninterruptedly at such a rate of progress as will insure Substantial Completion within the stipulated number of calendar days.

D. Liquidated Damages: It is expressly agreed between the Contractor and the Owner that the Contractor will be responsible for all damages which may arise due to the Contractor's failure to substantially complete the work within the above specified time. If the Contractor shall neglect, fail or refuse to complete the work within the specified number of days, or any extension thereof authorized by the Owner, Contractor agrees, as a part of the consideration for the execution of this Contract by the Owner, to pay the Owner the amount specified herein, not as a penalty, but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day, excluding Saturdays, Sundays and legal Holidays, that the Contractor shall be in default of Substantial completion after the date specified in the Agreement. Due to the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, said amount is agreed to be the amount of damages which the Owner would sustain, and said amount shall be retained from time to time by the Owner from current periodic estimates. The amount of liquidated damages shall be **$500** per day.

4. Performance of the Work

A. Direction of the Work: The Contractor shall supervise and direct the Work, using his best skills and attention which shall not be less than such state of skill and attention generally rendered by the contracting profession for projects similar to the Project in scope, difficulty and location. The Contractor shall maintain adequate supervisory personnel at the project site during the performance of the Work. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Agreement.

B. Responsibility for the Work: (1) The Contractor shall be responsible to the Owner for the acts and omissions of his employees, Subcontractors and their agents and employees, and other persons performing any of the Work under a contract with the Contractor. This obligation shall also extend to the presence on the Site of suppliers of materials or equipment, their employees, contractors, and agents engaged in the work.

(2) The Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the Owner in its administration of the Agreement, or by inspections, tests or approvals required or performed by persons other than the Contractor.

C. Permits and Fees: Unless otherwise expressly provided, the Contractor shall secure and pay for all permits and fees, licenses and inspections necessary for the proper execution and completion of the Work which are customarily secured after execution of the Agreement and which are legally required at the time the bids are received, and the same shall at all times be the property of the Owner and shall be delivered to the Owner upon completion of the Project.

D. Notices, Compliance With Laws: (1) The Contractor shall give all notices and comply with all federal, state and local laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the performance of the Work. The Contractor shall provide the Owner with reproductions of all permits, licenses and receipts for any fees paid. The Owner represents that it has disclosed to the Contractor all orders and requirements known to the Owner of any public authority particular to this Agreement.

(2) If the Contractor observes that any of the Contract Documents are at variance with applicable laws, statutes, codes and regulations in any respect, he shall promptly notify the Owner in writing, and any necessary changes shall be accomplished by appropriate modification.

(3) If the Contractor performs any Work which he knows or should know is contrary to such laws, ordinances, rules and regulations, and without such notice to the Owner, he shall assume full responsibility therefor and shall bear all costs attributable thereto.

(4) In the performance of the Work, the Contractor shall comply with all applicable federal, state and local laws and regulations including those relating to workplace and employee safety. The Contractor shall notify the Owner immediately of any conditions at the place of the work which violate said laws and regulations and shall take prompt action to correct and eliminate any such violations.

E. Project Superintendent: The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site at all times during the progress of the Work. The superintendent shall represent the Contractor and all communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be so confirmed on written request in each case.

F. Progress Schedule: The Contractor, immediately after being awarded the Contract, shall prepare and submit for the Owner's information an estimated progress schedule for the Work. The progress schedule shall be related to the entire Project to the extent required by the Contract Documents and shall provide for expeditious and practicable execution of the Work.

G. Drawings, Specifications and Submittals:

(1) The Contractor shall maintain at the site for the Owner one record copy of all Drawings, Specifications, Addenda, Change Orders and other Modifications,

and "As-Built" Drawings and Specifications in good order and marked currently to record all changes made during construction, and approved Shop Drawings, Product Data and Samples. These shall be delivered to the Owner upon completion of the Work.

(2) By approving and submitting Shop Drawings, Product Data and Samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

(3) The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Owner's approval of Shop Drawings, Product Data or Samples unless the Contractor has specifically informed the Owner in writing of such deviation at the time of submission and the Owner has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or Samples by the Owner's approval thereof.

(4) The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Owner on previous submittals.

(5) No portion of the Work requiring submission of a Shop Drawing, Product Data or Sample shall be commenced until the submittal has been approved by the Owner. All such portions of the Work shall be in accordance with approved submittals.

H. Protection of the Work and Owner's Property: The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this Agreement. He shall at all times safely guard and protect his own work, and that of adjacent property from damage. The Contractor shall replace or make good any such damage, loss or injury. The Contractor shall clean the work area and restore it to its original condition upon completion of the work.

I. Quality of the Work: The Contractor shall perform the work in a good, workmanlike manner. The Contractor hereby guarantees that the entire work constructed by him under the Agreement will meet fully all requirements thereof as to quality of workmanship and materials. The Contractor hereby agrees to make at his own expense any repairs or replacements made necessary by defects in materials or workmanship supplied to him that become evident within one (1) year after the date of the final payment, and to restore to full compliance with the requirements set forth herein any part of the work constructed hereunder, which during said one (1) year period is found to be deficient with respect to any provisions of the Contract Documents. The Contractor also agrees to hold the Owner harmless from claims of any kind arising from damage due to said defects. The Contractor shall make all repairs and replacements promptly upon receipt of written orders for same from the Owner. If the Contractor fails to make the repairs and

replacements promptly, the Owner may do the work and the Contractor shall be liable to the Owner for the cost thereof.

J. Warranty: The Contractor guarantees to Owner that all materials incorporated into the work will be new unless otherwise specified or agreed. Prior to final payment, the Contractor shall deliver to the Owner all manufacturers' warranties, together with such endorsements or assignments as are necessary to ensure to the Owner the full rights and benefits of such warranties.

5. Affirmative Action/Equal Employment Opportunity

The Contractor is directed to comply with all applicable State Laws, Ordinances, Bylaws, and rules and regulations regarding affirmative action/equal employment opportunity requirements. Failure of the Contractor to comply with any such law, rule or regulation shall constitute grounds for the Owner to terminate the Agreement.

6. Site Information Not Guaranteed; Contractor's Investigation

All information given in the Contract Documents relating to subsurface and other conditions, natural phenomena, existing pipes, and other structures is from the best sources at present available to the Owner. All such information is furnished only for the information and convenience of the Contractor and is not guaranteed.

It is agreed and understood that the Owner does not warrant or guarantee that the subsurface or other conditions, natural phenomena, existing pipes, or other structures encountered during construction will be the same as those indicated in the Contract Documents.

Contractor has familiarized himself with the nature and extent of the Contract Documents, work, locality, and with all local conditions and federal, state, and local laws, rules, ordinances, and regulations that in any manner may affect costs, progress, or performance of the work. Contractor has made, or has caused to be made, examinations, investigations, and tests and studies of such reports and related data in addition to those referred to in the paragraph above as he deems necessary for the performance of the work at the Contract Price, within the Contract Time, and in accordance with the other Terms and Conditions of the Contract Documents; and no additional examinations, tests, investigations, reports, and similar data are or will be required by the Contractor for such purposes.

Contractor has correlated the results of all such observations, examinations, investigations, tests, reports, and data with the Contract Documents. Contractor has given the Owner written notice of all conflicts, errors, or discrepancies that he has discovered in the Contract Documents, and the resolution thereof by the Owner is acceptable to the Contractor.

It is further agreed and understood that the Contractor shall not use or be entitled to use any of the information made available to him or obtained in any examination made by him in any manner as a basis of or ground for any claim or demand against the Owner, arising from or by reason of any variance which may exist between the information made available and the actual

subsurface conditions or other conditions or structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

7. Project Architect or Engineer

Vanasse Hangen Brustlin, Inc. (VHB) is the project engineer for this project. Except as otherwise indicated in the Contract Documents, the Engineer shall be a representative of the Owner and the Contractor shall direct all communications, questions and comments on the work and the performance thereof to the Engineer. Except as otherwise provided, the Engineer shall have all the authority of the Owner set forth in the Contract Documents. In general, the Engineer shall have the authority to review the performance of the work, reject work which is defective or otherwise does not comply with the Contract Documents and to order the Contractor to remedy defective work and take such actions which are necessary to make the work conform to the Contract Documents.

8. Wage Rates

Prevailing Wage Rates as determined by the Commissioner of the Department of Labor and Workforce Development under the provisions of Massachusetts General Laws, Chapter 149, Section 26 to 27G, as amended, apply to this project. It is the responsibility of the Contractor to provide the Town with certified payrolls and to comply with all requirements of the above-cited statutes.

The schedules of prevailing wage rates are included in the Contract Documents.

9. Payments to the Contractor

Within fifteen (15) days after receipt from the Contractor of a proper and satisfactory periodic estimate requesting payment of the amount due for the preceding month, the Owner shall have fifteen (15) days to make payment for:

A. The work performed during the preceding month.

B. The materials not incorporated in the Work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the Contractor has title, or to which a Subcontractor has title and has authorized the Contractor to transfer title to the Owner.

C. Less the following retention items:

1. A retention based on an estimate of the fair value of the Owner's claims against the Contractor.

2. A retention for direct payments to Subcontractors, if any, based on demands for same in accordance with the provisions of Section 39F of Chapter 30 of the General Laws.

3. A retention not exceeding five percent (5%) of the approved amount of the periodic payment.

D. After the receipt of a periodic estimate requesting final payment and within sixty-five (65) days after the Contractor fully completes the Work, or substantially completes the Work so that the value of the Work remaining to be done is, on the estimate of the Owner, less than 1% of the original Contract Price, or substantially completes the Work and the Owner takes possession or occupancy, whichever occurs first, the Owner shall pay the Contractor the entire balance due on the Contract less:

1. A retention based on an estimate of the fair value of the Owner's claims against the Contractor and of the cost of completing the incomplete and unsatisfactory items of work.

2. A retention for direct payments to Subcontractors, if any, based on demands of same in accordance with the provisions of Section 39F of Chapter 30 of the General Laws, or based on the record of payments by the Contractor to the Subcontractors under this Contract if such record of payment indicates that the Contractor has not paid Subcontractors as provided in Section 39F of Chapter 30 of the General Laws.

If the Owner fails to make payment as herein provided, there shall be added to each such payment, daily interest at the rate of 3 percentage points above the rediscount rate than charged by the Federal Reserve Bank of Boston, commencing on the first day after said payment is due, and continuing until the payment is delivered or mailed to the Contractor; provided that no interest shall be due, in any event, on the amount of a periodic estimate for final payment until fifteen (15) days after receipt of such a periodic estimate by the Owner as provided in the first paragraph of this Article. The Contractor agrees to pay to each subcontractor a portion of any such interest paid in accordance with the amount due each subcontractor.

The Owner may make changes in any periodic estimate submitted by the Contractor and the payment due on said periodic estimate shall be computed in accordance with the changes so made, and such changes and any requirements for a corrected periodic estimate shall not affect the due date for the periodic payment or the date for the commencement of interest charges on the amount of the periodic payment computed in accordance with the changes made, as provided herein; provided further, that the Owner may, within seven (7) days after receipt, return to the Contractor for correction, any periodic estimate which is not in acceptable form or which contains computations not arithmetically correct, and in that event, the date of receipt of such periodic estimate shall be the date of receipt of the corrected periodic estimate in proper form and with arithmetically correct computations. The date of receipt of a periodic estimate received on a Saturday shall be the first working day thereafter.

E. Changes in the Work: No changes in the work covered by the approved Contract Documents shall be made without prior written approval of the Owner. Charges or

credits for the work covered by the approved change shall be determined by one or more, or a combination of the following methods:

(a) Unit bid prices previously approved.

(b) An agreed lump sum.

(c) The actual cost of:

(1) Labor.

(2) Materials entering permanently into the work.

(3) The ownership or rental cost of construction equipment during the time of use on the extra work.

(4) Power and consumable supplies for the operation of power equipment.

(5) Wages to be paid.

To the cost under (c) there shall be added a fixed fee to be agreed upon but not to exceed fifteen percent (15%) of the actual cost of work. The fee shall be compensation to cover the cost of supervision, overhead, bond, profit and any other general expenses.

F. Claims for Additional Costs: If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give the Owner written notice thereof within twenty days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property. No such claim shall be valid unless so made. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

The Contractor hereby agrees that the Contractor shall have no claim for damages of any kind against the Town on account of any delay in the commencement or performance of the work and/or any hindrance, delay or suspension of any portion of the work including, but not limited to, any claims or damages on account of having to perform out of sequence work, claims for damages on account of loss of production or other interference with the work whether such delay is caused by the Town or otherwise, except as and to the extent expressly provided under G.L. c.30, §39O in the case of written orders by the Town. The Contractor acknowledges that the Contractor's sole remedy for any such claim will be an extension of time as provided herein.

10. Final Payment, Effect

The acceptance of final payment by the Contractor shall constitute a waiver of all claims by the Contractor arising under the Agreement.

11. Contract Documents

The Contract Documents consist of the following, together with this Agreement:

Invitation to Bid
Instructions to Bidders
This Contract Form
Form of Bid
Supplemental Forms for General Bid
Performance Bond
Labor & Materials Payment Bond
Non-Collusion Certificate
Tax Compliance Certificate
Certificate of Corporate Vote
Certificate of Insurance
General Conditions
Supplemental Conditions
Special Provisions
Issued Addenda
Contract Drawings
Schedule of Prevailing Wages

12. Terms Required By Law

This Agreement shall be considered to include all terms required to be included in it by the Massachusetts General Laws, and all other laws, as though such terms were set forth in full herein.

13. Indemnification

The Contractor shall indemnify and hold harmless the Owner from and against any and all claims, damages, losses, and expenses, including attorney's fees, arising out of the performance of this Agreement when such claims, damages, losses, and expenses are caused, in whole or in part, by the acts, errors, or omissions of the Contractor or his employees, agents, subcontractors or representatives.

14. Insurance

The Contractor shall purchase and maintain such insurance as will protect both the Owner and the Contractor from claims which may arise under the Agreement, including operations performed for the named insured by independent contractors and general inspection thereof by the named insured. In addition, the Contractor shall require its subcontractors to maintain such insurance. Coverage shall be provided for:

.1 claims under workers' or workmen's compensation, disability benefit and other applicable employee benefit acts;

.2 claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

.3 claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

.4 claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person;

.5 claims for damages, including damages to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom; and

.6 claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

.7 claims involving contractual liability applicable to the Contractor's obligations under Article 13.

The limits of liability for coverage required under the preceding paragraph shall be as Specified in the Supplemental Conditions.

Except for Workmen's Compensation, all liability coverage shall name the Town as an additional insured and shall provide for 30 days prior written notice to the Town of any modification or termination of coverage provided thereby. The Contractor shall provide the Owner with appropriate certificate(s) of insurance evidencing compliance with this provision prior to the commencement of any work under this Agreement.

15. Notice

All notices required to be given hereunder shall be in writing and delivered to, or mailed first class to, the parties' respective addresses stated above. In the event that immediate notice is required, it may be given by telephone or facsimile, but shall, to the extent possible, be followed by notice in writing in the manner set forth above.

16. Termination

A. Each party shall have the right to terminate this Agreement in the event of a failure of the other party to comply with the terms of the Agreement. Such termination shall be effective upon seven days' notice to the party in default and the failure within that time of said party to cure its default.

B. The Owner shall have the right to terminate the Agreement without cause, upon ten (10) days' written notice to the Contractor. In the event that the Agreement is terminated pursuant to this subparagraph, the Contractor shall be reimbursed in accordance with the Contract Documents for all Work performed up to the termination date, and for all materials or equipment not incorporated in the Work, but delivered and suitably stored at the site. Payment for material or equipment stored at the site shall be conditioned upon submission by the Contractor of bills of sale or such other evidence as is satisfactory to Owner to establish the Owner's title to such material or equipment or otherwise protect the Owner's interests.

17. Miscellaneous

A. Royalties and Patents: The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified; but if the Contractor believes or has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Owner, and thereafter the Owner insists on the use of the design, process or products specified.

B. Assignment: The Contractor shall not assign or transfer any of its rights, duties or obligations under this Agreement without the written approval of the Owner.

C. Governing Law: This Agreement shall be governed by and construed in accordance with the law of the Commonwealth of Massachusetts.

D. By its signature hereon, the Contractor certifies, under the pains and penalties of perjury, that it has complied with all laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

[Remainder of page intentionally blank.]

AGREED:

TOWN OF CARVER, MASSACHUSETTS
(Owner)

By its _____

_____

CONTRACTOR: _____

By_____

_____
(Name)

_____
(Title)

_____
(Address)

_____
(City and State)

Approved as to Form:

By_____
(Owner's Counsel)

In accordance with G.L. c.44, Section 31C, this is to certify that an appropriation in the amount of this contract is available therefor and that the Town Administrator has been authorized to execute the contract and approve all requisitions and change orders.

By_____
(Owner's Accountant)

_____
(Name)

VOTE OF CORPORATION
AUTHORIZING EXECUTION OF CONTRACT

At a meeting of the Board of Directors of _____ duly called and held on _____, 20___, at which a quorum was present and acting throughout, the following vote was duly adopted.

VOTED: THAT_____ the _____ of the corporation, be and hereby is authorized to affix the corporate seal, sign and deliver in the name and behalf of the corporation, any Contract, Agreement or Obligation in this Corporation's name on its behalf.

I do hereby certify that the above is a true and correct copy of the record, that said Vote has not been amended or repealed, and is in full force and effect as of this date, and that _____ _____ is the duly elected _____ of this Corporation.

ATTEST:

_____

Clerk

(Corporate Seal)

SUPPLEMENTAL CONDITIONS

§ SC 1.1 INTRODUCTION

The following provisions modify, change, delete from or add to the Agreement. Where any Subsection of the Agreement is modified or any Article, Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplemental Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

§ SC 2.1 PREVAILING WAGE

In accordance with General Laws Chapter 149, Section 26 through 27D, the Contractor is obligated to comply with the prevailing wage rates established by the Commissioner of the Department of Labor and Workforce Development for mechanics, apprentices, chauffeurs, teamsters and laborers employed on the Project. The schedule of applicable prevailing wage rates for the Project, together with a Certificate of Compliance therewith, are set forth in the documents herein.

§ SC 3.1 CONTRACTOR'S LIABILITY INSURANCE

In no case shall the limits of liability be less than the following:

1. Contractor's Liability Insurance

a. Workers' Compensation:

   1. State: Statutory

   2. Employer Liability:

   3. $1,000,000 Bodily Injury by Accident
      $1,000,000 Bodily Injury by Disease – policy limit
      $1,000,000 Bodily Injury by Disease – each
      $10,000,000 Umbrella Liability – all limits

b. Comprehensive General Liability (including Premises-Operations; Independent Contractor's Protective; products and Completed Operations; Broad Form Property Damage):

   1. Bodily Injury:
      $1,000,000 Each Occurrence
      $2,000,000 Aggregate

   2. Products and Completed Operations
      $2,000,000 Each Occurrence (bodily injury and property damage)
      $2,000,000 Aggregate

   3. Property Damage Liability (including coverage for XCU hazards).
      $2,000,000 Each Occurrence
      $2,000,000 Aggregate

   4. Products and Completed Operations insurance shall be maintained for a minimum period of 2 years after final payment and Contractor shall continue to provide evidence of such coverage to Owner on an annual basis during the aforementioned.

5. Contractual Liability (Hold Harmless Coverage):
   $1,000,000 Bodily Injury Each Occurrence
   $1,000,000 Property Damage Each Occurrence
   $2,000,000 Property Damage Aggregate

6. Personal Injury, with Employment Exclusion deleted:
   $2,000,000 All Limits

c. Comprehensive Automobile Liability (owned, non-owned, hired):

   Combined single limit - $1,000,000

   1. Bodily Injury

   2. Property Damage

d. Property Insurance / Builders Risk: the full Contract sum

e. Umbrella Liability Coverage
   $10,000,000 All Limits

Bonds

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

That we _____(Name of Contractor) a _____(Corporation, Partnership or Individual) hereinafter called "Principal" and _____ (Surety) of _____, State of _____ hereinafter called the "Surety," are held and firmly bound unto the Town of Carver, Massachusetts, hereinafter called "Owner," in the sum of _____ Dollars ($ _____ _____) in lawful money of the United States for the payment of which sum well and truly to be made, we bind ourselves, and heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the Owner, dated the ___day of _____ , 20___ , a copy of which is hereto attached and made a part hereof for the Montello Street at Route 58 Re-alignment Project.

NOW, THEREFORE, if the Principal shall promptly make payments to all persons, firms, subcontractors and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such contract, and any authorized extensions or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal, and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all telephone, electric, water or other utility service, or rental of equipment directly applicable to the contract, and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulated and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder of the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

PROVIDED, FURTHER, that the amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed or recorded against such improvements, whether or not claim for the amount of such lien be presented under and against this bond.

In WITNESS WHEREOF, we hereto set out hands and seals, this the ____ day of _____, 20___.

ATTEST:

_____
Principal

_____
(Principal Secretary)

(SEAL)

By: _____(S)

_____
(Address – Zip Code)

_____
Witness as to Principal

_____
(Address – Zip Code)

ATTEST:

_____
Surety

_____
(Surety Secretary)

By: _____
Attorney-in-Fact

(SEAL)

_____
(Address – Zip Code)

_____
Witness as to Surety

_____
(Address – Zip Code)

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute Bond.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That we _____
(Name of Contractor)

a _____ hereinafter called "Principal" and
(Corporation, Partnership, Joint Venture or Individual)

_____of _____, State of _____
(Surety) (City & State)

_____ hereinafter called the "Surety" and licensed by the State Division of Insurance to do business under the laws of the Commonwealth of Massachusetts, are held and firmly bound to the Town of Carver, Massachusetts, hereinafter called "Owner", in the penal sum of _____ Dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that Whereas, the Principal entered into a certain contract with the Owner, dated the _____ day of _____, 20___ (the "Construction Contract"), for the construction described as follows: Montello Street at Route 58 Re-alignment Project.

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of the Construction Contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and if he shall satisfy all claims and demands incurred under the Construction Contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the Surety's obligation under this Bond shall arise after (1) the Owner has declared the Principal in default of the Construction Contract or any provision thereof or (2) has declared that the Principal has failed, or is otherwise unable or unwilling, to execute the work consistent with, and in conformance to, the Construction Contract (collectively referred to as a "Contractor Default"). The determination of a Contractor Default shall be made solely by the Owner. The Owner need not terminate the Construction Contract to declare a Contractor Default or to invoke its rights under this Bond.

When the Surety's obligation under this Bond arises, the Surety, at its sole expense and at the consent and election of the Owner, shall promptly take one of the following steps: (1) arrange for the Principal to perform and complete the work of the Construction Contract: (2) arrange for a contractor other than the Principal to perform and complete the work of the Construction Contract; (3) reimburse the Owner, in a manner and at such time as the Owner shall decide, for all costs and expenses incurred by the Owner in performing and completing the work of the Construction Contract. Surety will keep Owner reasonably informed of the progress, status and results of any investigation of any claim of the Owner.

If the Surety does not proceed as provided in this Bond with due diligence and all deliberate speed, the Surety shall be deemed to be in default of this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner.

After the Surety's obligation under this Bond arises, the Surety is obligated, to the limit of the amounts of this Bond, for (1) the correction of defective work and completion of the Construction Contract; (2) additional design, professional services, and legal costs, including attorneys' fees, resulting from the Contractor Default or from the default of the Surety under this Bond; (3) any additional work beyond the Construction Contract made necessary by the Contractor Default or default of the Surety under this Bond; (4) indemnification obligation of the Principal, if any, as provided in the Construction Contract; and (5) liquidated damages as provided in the Construction Contract, or if none are so specified, actual and foreseeable consequential damages resulting from the Contractor Default or default of the Surety under this Bond.

Any proceeding, legal or equitable, under this Bond shall be instituted in any court of competent jurisdiction in the Commonwealth of Massachusetts.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Construction Contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Construction Contract or to the work or to the specifications.

IN WITNESS WHEREOF, this instrument is executed in _____ ( ) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20___.

ATTEST:

_____
Principal

_____ By _____
(Principal Secretary)

_____

_____

_____
(Address-Zip Code)

_____ (SEAL)
Witness as to Principal

_____

_____
(Address-Zip Code)

ATTEST:

_____
Surety

_____ By _____
(Attorney-in-Fact)

_____

_____
(Address-Zip Code)

_____ (SEAL)
Witness as to Surety

_____

_____
(Address-Zip Code)

NOTE: Date of Bond must not be prior to date of Contract.
If Contractor is a Partnership, all partners should execute Bond.

Special Provisions

SPECIAL PROVISIONS
Montello Street at Main Street (Route 58) Intersection Reconfiguration
Carver, Massachusetts

SCOPE OF WORK

All work under this Contract shall be done in conformance with the *MassDOT 2021 Standard Specifications for Highways and Bridges*, the *MassDOT Supplemental Specifications* dated March 31, 2021, the *MassDOT 2017 Construction Standard Details*, the *MassDOT Traffic Management Plans and Detail Drawings*, *MassDOT Work Zone Safety Temporary Traffic Control*, the *MassDOT 1990 Standard Drawings for Signs and Supports*; the *MassDOT 2015 Overhead Signal Structure & Foundation Standard Drawings*, the *2009 Manual on Uniform Traffic Control Devices (MUTCD)* with Massachusetts Amendments; the *1968 Standard Drawings for Traffic Signals and Highway Lighting*; *The American Standard for Nursery Stock*; the Plans and these Special Provisions.

The work under this Contract consists of the furnishing all necessary labor, materials, and equipment to reconfigure the intersection of Montello Street at Main Street (Route 58) from its current location to a location approximately 400 ft north. The proposed work includes grading, unclassified excavation, pavement reclamation, full-depth hot mix asphalt pavement, pavement milling and overlay, box widening, granite curb, HMA berm, guardrail, drainage improvements, water line installation, culvert replacement, a traffic signal system, pavement markings, signs, landscaping, and other incidental work.

There are two add alternates for the project. Add alternate #1 consists of pavement reclamation and full depth roadway reconstruction on an additional 700’ length of Montello Street and add alternate #2 consists of installation of an additional 750’ of water line on the same section of Montello Street.

The General Conditions and Special Provisions shall take precedence over the General Requirements of Division I of the Standard Specifications.

PERMITS

The Contractor is required to obtain all necessary permits, including a road opening permit from the Town of Carver, and any other permits required for all work that is to take place in or on the public way.

WORK SCHEDULE

Work on this project is restricted to a normal eight-hour day, five-day week, with the Contractor and all Subcontractors working on the same shift.

No work shall be done on this Contract on Saturdays, Sundays, or holidays or on the day before or the day after a long weekend which involves a holiday without prior approval by the Engineer and the Boston Transportation Department.

No work that will disrupt travel on the existing public roadways (lane closures, lane shifts, trenching, etc.) shall be done from 6:00AM to 9:00AM or from 3:00PM to 6:00PM. The normal hours of operation shall be dictated by the Town of Carver. A written request shall be issued by the Contractor for any requested deviation to the work days or times specified by the Town of Carver.

COOPERATION OF THE CONTRACTOR
(Supplementing MassDOT Subsections 5.05 and 5.06)

Agents of various public service agencies, municipal departments, utility companies, and private site contractors may be entering on the work site to remove existing utilities, to construct or place new facilities, or to make alterations to existing facilities.

The Contractor shall perform the work in cooperation with the various agencies in a manner which causes the least interference with the operations of the aforementioned agencies and shall have no claim for delay which may be due, or result, from said work of these agents.

CONSTRUCTION STAKING
(Supplementing MassDOT Subsection 5.07)

The information and ties for the survey baseline and benchmarks are provided on the Plans. The Contractor shall perform all survey required for the work.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) FILE NUMBER SIGNS
(Supplementing MassDOT Subsection 7.01)

This project is subject to Massachusetts General Laws, Chapter 131, Section 40 as amended.

Signs shall be in accordance with the latest MassDOT Construction Standards. All costs for the manufacturing, erection, maintenance, moving, and removal of the signs shall be absorbed by the contractor with no additional compensation other than the contract unit prices.

The Massachusetts Department of Environmental Protection File Number is SE#126-617.

PUBLIC SAFETY AND CONVENIENCE
(Supplementing MassDOT Subsection 7.09)

The Contractor shall provide necessary access for fire apparatus and other emergency vehicles through the work zones to abutting properties at all times.

Sweeping and cleaning of surfaces beyond the limits of the project required to clean up material caused by spillage or vehicular tracking during the various phases of the work shall be considered as incidental to the work being performed under the Contract and there will be no additional compensation.

NOTICE TO OWNERS OF UTILITIES
(Supplementing MassDOT Subsection 7.13)

Written notice shall be given by the Contractor to all public service corporations or municipal and State officials owning or having charge of publicly or privately owned utilities at least one week in advance of the commencement of operations that will affect the utilities. The Contractor shall, at the same time, file a copy of such notice with the Engineer.

Before commencing work on service connections, the Contractor shall be responsible for contacting the Electric Company servicing the area to obtain construction requirements, standards, and to give adequate notice of commencement of work. The Contractor's attention is further directed to the requirements of Work in the Immediate Vicinity of Certain Underground Structures and Poles herein included in these Special Provisions.

The following are the names of owners and representatives of the principal utilities affected, but completeness of this list is not guaranteed by the Town of Carver or the Engineer:

TOWN OF CARVER

Department of Public Works 108 Main Street (Town Hall) Carver, MA 02330	John Woods Deputy Director Phone: (508) 866-3425
Fire Department 99 Main Street Carver, MA 02330	Craig Weston Fire Chief Phone: (508) 866-3440
Police Department 3 Center Street Carver, MA 02330	Marc Duphily Chief of Police Phone: (508) 866-2000

ELECTRIC

Eversource Electric “B” 50 Duchaine Blvd. New Bedford, MA 01745	Brian Mello Email: brian.mello@eversource.com

TELEPHONE

Verizon 385 Myles Standish Blvd. Taunton, MA 02780	Karen Mealey Phone: (774) 409-3160 Email: karen.m.mealey@verizon.com

GAS

Enbridge
8 Wilson Way
Westwood, MA 02090

Kathy M. Aruda
Phone: (508) 938-7728
Email:
kathleen.aruda@enbridge.com

Eversource Gas
157 Cordaville Road, 3113
Southborough, MA 01772

Jeffrey Evans-Mongeon
Phone: (508) 305-6970
Email:
Jeffrey.Evans-Mongeon@eversource.com

CABLE

Eversource Fiber
247 Station Drive
Mail Stop: SUM SE 320
Westwood, MA 02090

Tomi Fadipe
Phone: (781) 441-3864
Email:
oloruntomi.fadipe@eversource.com

Comcast Cable Corp.
PO Box 6505, 5 Omni Way
Chelmsford, MA 01824

Wendy Brown
Phone: (978) 848-5163
Email:
Wendy_Brown@comcast.com

WATER

North Carver Water District
108 Main Street (Town Hall)
Carver, MA 02330

Jack Hunter
Phone: (508) 866-3450

OTHER AFFECTED PARTIES ARE:

MassWorks Infrastructure Program
Exec. Office of Housing and Econ. Dev.
One Ashburton Place, Room 2101
Boston, MA 02108

Jong Wai Tommee
Program Manager
Phone: (617) 788-3611

Vanasse Hangen Brustlin, Inc.
101 Walnut Street
Watertown, MA 02471-9151

Wayne Amico, PE
Senior Team Leader
Phone: (617) 607-1577

The Contractor shall make his own investigation to assure that no damage to existing structures, drainage lines, traffic signal conduits, or any other utilities, occurs as a result of construction operations.

The Contractor shall notify "Mass. DIG SAFE" and procure a DIG SAFE number of each location prior to disturbing ground in any way.

"DIG-SAFE" Call Center: Telephone 1-888-344-7233

PROTECTION OF UTILITIES AND PROPERTY
(Supplementing MassDOT Subsection 7.13)

The Contractor, in constructing or installing facilities alongside or near sewers, drains, water or gas pipes, electric or telephone conduits, poles, sidewalks, walls, vaults or other structures shall sustain them securely in place. The Contractor shall coordinate with the officers and agents of the various utility companies and municipal departments to assure that the services of these structures are maintained. The Contractor shall also be responsible for the repair or replacement, at no additional cost to the Town, of any damage to such structures caused by construction operations. The Contractor is responsible to leave them in the same condition as they existed prior to commencement of the work. In case of damage to utilities, the Contractor shall promptly notify the utility owner and shall, if requested by the Engineer, furnish labor and equipment to work temporarily under the utility owner's direction. Pipes or other structures damaged by the operation of the Contractor may be repaired by the Town or by the utility owner which suffers the loss. The cost of such repairs shall be borne by the Contractor, without compensation therefor.

If during construction there is an existing utility and/or structure found to be in conflict with the proposed work under this Contract, the Contractor shall protect and maintain the services to the utilities and structures and promptly notify the Town and the Engineer. The Engineer will, as soon as possible, identify the utilities to be relocated or other such activities deemed suitable for resolution.

If live service connections are to be interrupted by excavations of any kind, the Contractor shall not break the service until new services are provided. Abandoned services shall be plugged off or otherwise made secure.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing all the work involved in protecting or repairing property as specified in this Section, shall be considered included in the prices paid for the various Contract items of work and no additional compensation will be allowed therefor.

WORK IN THE IMMEDIATE VICINITY OF CERTAIN UNDERGROUND STRUCTURES AND UTILITY POLES

For overhead connections, the Electric Company servicing the area will make the connection from the top of the riser on the utility pole to the power source. The Contractor shall supply all labor, materials and equipment to install the service connection, complete in place and in accordance with the Electric Company procedures, from the controller to and including the riser with enough wire coiled above the riser to permit the Electric Company servicing the area to make the final connection.

For underground connections, the Electric Company servicing the area will perform the actual wiring of the service connections from its power source to the sweep at the local controllers, but all steel sweeps, ducts, entrance holes into manholes, patching and all other necessary labor, materials and equipment required to install the electric service, complete in place, shall be furnished by the Contractor.

The Contractor shall pay the Electric Company servicing the area for their services rendered for the connection of overhead and underground service connections.

Before starting work at existing manholes, the Contractor shall test for gas and blow out the manholes.

PROVISIONS FOR TRAVEL AND PROSECUTION OF THE WORK
(Supplementing MassDOT Subsection 8.03)

Before starting any work under this Contract, the Contractor shall prepare, and submit to the Engineer and the Town of Carver for approval, a plan (based on the Contract traffic management plans) that indicates the traffic routing proposed by the Contractor during the various stages and time periods of the work and the temporary barricades, signs, drums and other traffic control devices to be employed during each stage and time period of the work to maintain traffic and access to abutting properties.

Particular care shall be taken to establish and maintain methods and procedures that will not create unnecessary or unusual hazards to public safety. Traffic control devices required only during working hour operations shall be removed at the end of each working day.

The Contractor shall also prepare and submit a bi-weekly schedule of activities and locations to the Engineer and the Town for posting on the Town's Website for public information.

Safety devices and sign placement shall conform to the applicable sketches shown in the standard Temporary Traffic Control Plan (TTCP), conforming to the MUTCD, available at the MassDOT's website: www.massdot.state.ma.us/highway.

Signs having messages that are irrelevant to normal traffic conditions shall be removed or properly covered at the end of each work period. Signs shall be kept clean at all times and legends shall be distinctive and unmarred.

NOTIFICATION TO ABUTTERS

The Contractor shall hand deliver notices to abutting properties at least 24 hours before the start of construction. The notice will indicate the timing of the construction and any access restrictions or other inconveniences that may result.

The Contractor shall notify and coordinate with the Town's waste disposal contractor and school bus and transit companies when construction activities commence.

TEMPORARY ACCESS TO AREA MERCHANTS AND BUSINESSES
(Supplementing MassDOT Subsections 8.02 and 8.06)

The work is in a section of the Town with residential, retail, and commercial business uses and access to all properties must be maintained at all times.

The Contractor shall provide safe and ready means of ingress and egress to all stores and shops, public and private and professional offices and any other businesses or residences in the project area, both day and night, for the duration of the project.

SAFETY CONTROLS FOR CONSTRUCTION OPERATIONS
(Supplementing MassDOT Subsection 850.21 AND 850.61)

Safety controls for construction operations shall be done in accordance with the relevant provisions of Section 850 of the Standard Specifications, the Manual on Uniform Traffic Control Devices, the Traffic Management Plan and the following:

The providing of safety controls for construction operations shall be considered incidental to this contract and the costs for safety controls shall be included in the unit bid price for those contract items requiring such controls.

Positioning, adjusting, and re-positioning of all devices such as traffic cones, high level warning devices, etc., not otherwise classified and paid for under other items in this contract, is considered incidental and no separate payment will be made.

WORK DONE BY OTHERS

Relocation and/or resetting to new grades of all private utilities, including utility poles, gas gates, telephone manholes, made necessary by the construction of this project, will be accomplished by the respective utility companies.

The Contractor must prosecute the work efficiently and with the least possible delay. Immediately after award of the Contract, the Contractor shall confer with the owners of all utilities to assure that relocations of facilities and services may be made at times consistent with operations under this Contract.

MATERIAL REMOVED AND STACKED

Materials designed to be removed and stacked which are the property of the Town which in the opinion of the Engineer are salvageable shall be carefully removed, transported, and stacked. The relevant material shall be stacked at the Carver DPW located at Carver Department of Public Works, 51 Pond Street, Carver. The Engineer shall be notified at least twenty-four (24) hours preceding such delivery. An inventory of stacked materials shall be made out by the Contractor, countersigned by the Engineer, and submitted to the person or persons authorized by the Town to receive the materials.

If the Engineer determines that any part of the stacked materials is unsuitable for re-use by the Town or the Town decides to abandon part of their materials, such materials shall become the property of the Contractor and shall be legally disposed of away from the site.

The contract prices for the various items shall include full compensation for the services noted above.

DISPOSAL OF EXCAVATION MATERIAL

Surplus materials obtained from any type of excavation, and all existing and other materials not required to be removed and stacked or needed for use on the project, as determined by the Engineer and approved by the owner shall be tested and the disposal method shall be approved by the owner. The disposed material shall be subject to the regulations and requirements of local authorities governing the disposal of such materials.

The cost of this work shall be considered incidental to the cost of the Excavation and no separate payment will be made.

MAINTENANCE OF TRAFFIC SIGNALS

It shall be the responsibility of the Contractor to provide all labor, equipment and material required for the total maintenance and repair of all proposed traffic signal control equipment, including damage by automobile accidents until final completion and acceptance of the project, unless otherwise specified under Subsection 7.17 "Traffic Accommodation: of the Standard Specifications as amended, in which case Subsection 7.17 will govern. These provisions will apply to the signalized location included as part of this construction Contract from the date of written notice given to the Engineer that the Contractor will work on or adjacent to an existing signal until the date when the Town accepts the complete project. This written notice must be given before the Contractor may proceed with any work on a specified traffic signal location. For the purpose of these Special Provisions, the phrase "Traffic Signal Control Equipment" is intended to include, but is not limited to, controllers, signal housings, supporting structures, cabinet accessories and panels, wires, conduit and all other ancillary electrical equipment used for traffic control.

The cost of the maintenance of signals shall be deemed to be included in the various traffic signal Contract items and no additional payments will be made.

FINE TUNING, ADJUSTMENT, AND TESTING PERIOD

After the Contractor has finished installing the controller and all other associated signal equipment and after the Contractor has set the signal equipment to operate as specified in the Contract documents, the fine tuning, adjusting and testing period shall begin. The Contractor shall advise the Engineer, in writing, of the date of the beginning of the fine tuning and testing period. This period shall not start until the work at the intersection is complete. During this period, the Contractor, under the direction of the Engineer, shall make necessary adjustments and tests to insure safe and efficient operation of the equipment. This period shall last for 30 days and the Contract completion date has taken this testing period into consideration. No request for final acceptance will be considered until successful completion of the testing period.

The Contractor shall notify the Engineer and Town in writing of the starting date of the fine-tuning period prior to the starting date.

FINAL INSPECTION AND ACCEPTANCE

Upon successful completion of the 30-day testing period wherein the traffic signals have operated for 30 days without failure, the Contractor shall notify the Town. The Engineer will make a final inspection of the installation in the presence of Town and the Contractor. An inspection check will be made to ensure that all equipment, materials, installations and operations are in accordance with the construction contract, plans and specifications. Items to be checked will include, but not be limited to, traffic signal systems and flashing warning beacon operation, cabinet equipment, documents (wiring diagrams, as-built plans, instruction manuals, parts list, warranties, grounding resistivity test report, etc.), signs, and pavement markings, and street hardware (posts, bases, housings, brackets, etc.).

The Engineer will notify the Contractor in writing of any items in which the inspection reveals that the work is incomplete, defective, or does not otherwise meet the project specifications. The Contractor shall perform the corrective actions necessary to achieve final acceptance by the Town. These corrective actions shall be done by and at the expense of the Contractor and within 15 days of the date of the inspection report, unless otherwise approved in writing by the Town.

GUARANTEE AFTER FINAL ACCEPTANCE

The Contractor shall diagnose (troubleshoot) the system and replace any part of the traffic signal systems and flashing warning beacon found to be defective in workmanship, material or manner of functioning within six months from date of final acceptance of all the installations under this Contract. This requirement does not affect the one-year warranty period on equipment specified in Subsection 815.20 of the Standard Specifications.

Upon the date of acceptance of the project by the Town, the Contractor shall turn over all guarantees and warranties to the Town.

QUALIFIED ELECTRICIANS

Within 10 days after opening of bids, the low bidder shall submit a list of the Journeyman Electricians (Massachusetts License) who will perform the electrical work in this contract.

Also, the low bidder shall submit copies of each Journeyman Electrician's current Massachusetts License.

PROPERTY BOUNDS

The Contractor shall exercise due care when working around all property bounds which are to remain. Should any damage to a bound result from the actions of the Contractor, the bound shall be replaced and/or realigned by a licensed surveyor in the Commonwealth hired by the Contractor as directed by the Engineer at no cost to the Owner in accordance with Article 4.05 of the General Conditions.

ORDER OF CONDITIONS

The Contractor is advised that the Order of Conditions for this project, (SE#126-617) issued by the Town of Carver on April 28, 2021, is part of this contract.

A copy of the Order of Conditions is included in these Special Provisions.

The Contractor shall be responsible for meeting all conditions for the attached order. No separate payment will be made for complying with the orders of conditions, except as noted in the special provisions, but all costs in connection therewith shall be included in the unit prices bid for the various contract items.

DRAINAGE

The Contractor shall clean, inspect and video all drainage within the project limits prior to the paving of top course pavement. No separate payment will be made for the inspection and video effort, but all costs in connection therewith shall be included in the unit prices bid for the various Contract items.

All drainage castings in new pavement areas shall be installed at base or binder course grade, as directed by the Engineer, and reset to proposed finish surface grade prior to placement of the pavement surface course.

All pipes and structures installed as part of this Contract shall be left in a clean and operable condition at the completion of the work.

All existing pipes to be abandoned shall be plugged with brick masonry not less than 8 inches in thickness in conformance with the MassDOT Standard Specifications, Section 201.62.

No separate payment will be made for the maintenance of the existing drainage system or for plugging of pipes, but all costs in connection therewith shall be included in the unit prices bid for the various Contract items.

EXCAVATION FOR STRUCTURES

Any excavation support systems, dewatering, temporary fence, etc. required for drainage manholes and catch basins shall be included in the unit price bid for the various items.

ACCESS TO MANHOLES AND CATCH BASINS

The Contractor shall provide access to these structures for the Owner (public or private) in the event of an emergency. The Contractor shall be available to access any buried structure 24 hours a day with a maximum 2-hour response time.

SAWCUTS

Existing pavements to remain shall be sawcut at all openings for utility work, for new or reset curb, and at all joints with proposed driveway limits and hot mix asphalt pavement limits as shown on the plans and as directed by the Engineer.

All sawcuts for hot mix asphalt materials shall be incidental to the project.

NEW INTRODUCTIONS OF INVASIVE PLANTS INTO OR AROUND THE SITE

(Supplementing MassDOT Subsections 7.01(D) Plant Pest Control and 7.13 Protection and Restoration of Property)

The Contractor shall ensure that no invasive plant species, as defined and listed as Invasive, Likely Invasive, or Potentially Invasive, by the Massachusetts Invasive Plant Advisory Group http://www.massnrc.org/MIPAG, are introduced or spread around the site by construction activities including but not limited to improperly cleaned construction equipment and importation of infected materials such as borrow, compost, nursery stock, seed, or hay bales. Corrective measures, if necessary, shall be made by the Contractor as directed by the Engineer.

The Contractor shall be solely responsible for all costs associated with ensuring that invasive species are not introduced or spread around the site by construction activities and for all corrective measures required for as long as necessary to eliminate the introduced invasive plant species and prevent re-establishment of the same.

TOWN OF CARVER ROAD OPENING AND TRENCH PERMITS

The Contractor will be required to obtain all necessary permits from the Town of Carver before the commencement of construction. All requirements, Town ordinances, laws, and rules specified by the Town shall be strictly adhered to.

ITEM 102.1 **TREE TRIMMING** **FOOT**

The work under this item shall conform to the relevant provisions of Section 8.08 and 101 of the Standard Specifications and the following:

The work shall include the trimming of low hanging tree limbs in areas adjacent to the proposed edge of pavement which may conflict with construction operations or the safe passage of vehicles.

The work shall also include the trimming of low hanging tree limbs in the project area that conflict with construction and operation of the traffic signal system, the emergency preemption system and visibility of the traffic signals.

The work under this item shall include coordination and assistance with the utility pole relocation work to be done by Eversource. The Contractor shall perform any tree trimming needed for the purpose of relocating utility poles.

Tree trimming shall be done only upon direction by the Engineer and after verification of the location of the edge of traveled way and/or restricted visibility.

The method of disposal of all materials shall be the responsibility of the Contractor and shall be approved by the Engineer. All methods of disposal shall be accomplished in accordance with all applicable Federal, State, and local ordinances.

Tree trimming will be paid for at the per foot price bid for Item 102.1, which price shall include all labor, material, equipment and incidental costs required to complete the work including the off-site disposal of all cuttings and other materials resulting from the work.

ITEM 102.511 TREE PROTECTION-ARMORING AND PRUNING EACH
ITEM 102.521 TREE AND PLANT PROTECTION FENCE FOOT

The work under these items shall conform to the relevant provisions of Sections 101, 644 and 771 and the following:

The purpose of these items is to prevent damage to branches, stems and root systems of existing individual trees as well as shrubs and other quality vegetation to remain, and to ensure their survival. To the extent possible, to avoid soil compaction within the root zone, construction activities including, but not limited to, vehicle movement, excavation, embankment, staging and storage of materials or equipment shall not occur underneath the canopy (drip line) of trees to remain. Where these activities will occur within 10 feet (3 meters) of the canopy of trees or where directed, the Contractor shall take the appropriate protective measures specified herein.

Tree Protection-Armoring and Pruning, Item 102.511, shall be used when construction activities are likely to occur within the canopy of individual trees or where there may be any risk of damage to trees.

Tree and Plant Protection Fence, Item 102.521 shall be used to protect areas of existing trees or other areas of quality vegetation that is to remain.

The Contractor shall be solely responsible for judging the full extent of the work requirements, including, but not necessarily limited to any equipment and materials necessary for providing tree protection.

Incidental to the cost of these items, the Contractor shall retain the services of a certified arborist, who shall make recommendations as to the specific appropriate treatment of trees within or near the work zone.

Prior to any construction activities, the Contractor and Arborist shall walk the site with the Engineer and Town Tree Warden to identify which trees will require protection and to determine approved measures. The Arborist shall make recommendations as to appropriate methods to trees. The Engineer will have final decision as to trees and methods.

The Contractor is responsible for the protection of all existing trees and plants within and immediately adjacent to the construction area that are not designated to be removed for the length of the construction period.

SUBMITTALS

Incidental to this item, the Contractor shall provide to the Engineer one (1) copy American National Standards Institute (ANSI) Standard Z-133.1 and A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance, Part 1: Pruning. These references shall be kept by the Engineer at his office for the length of the Contract.

Prior to start of work, the Contractor shall submit to the Engineer the name and certification number of the Massachusetts Certified Arborist referenced herein. Cost for Certified Arborist for all activities pertaining to this Item shall be incidental to this item.

ITEM 102.511 & ITEM 102.521 (Continued)

MATERIALS

Fence and temporary fence posts shall be subject to the approval of the Engineer.

Fencing for individual plants shall be polyethylene fencing or chain link fence (new or used).

Staking for individual tree protection fencing shall be steel posts or 2x4 lumber as directed and approved by the Engineer.

Wood chips shall conform to provisions of Wood Chip Mulch under Materials Section M6.04.3.

Trunk protection shall be 2x4 cladding, at least 8 feet (2.4 meters) in length, clad together with wire. Alternative materials shall be at the approval of the Engineer. Alternative materials shall provide adequate protection from anticipated construction activities and shall not injure or scar trunk. Trunk protection shall include burlap to separate trunk cladding from bark.

Temporary Tree Protection Fence shall be brightly colored polypropylene barricade or wooden snow fencing for tree protection or safety fencing as shown on the Contract drawings or as directed by the Engineer. Fencing shall be a minimum of 4 feet high (1.2 meters) and supported by steel or hardwood stakes spaced at a maximum of 8 feet (2.4 meters) on center or by other means acceptable to the Engineer. Fencing shall be materials and fastenings sufficient to provide sturdy and highly visible separation of the construction activates from the trees and existing plantings to be preserved

Incidental to these items, the Contractor shall provide water for maintaining plants in the construction area that will have exposed root systems for any period during construction.

CONSTRUCTION METHODS

To the extent possible, to avoid soil compaction within the root zone, construction activities including, but not limited to, vehicle movement, excavation, embankment, staging and storage of materials or equipment shall not occur underneath the canopy (drip line) of trees to remain. Where these activities will occur within 10 feet (3 meters) of the canopy of trees, the Contractor shall provide Individual Tree Protection as specified herein.

For individual tree protection, the Contractor shall set posts and fencing at the limits of the tree canopy. Where construction activities closer to the trees is unavoidable, the contractor shall tie branches out of the way and place wood chips to a depth of 6 inches (150 mm) on the ground to protect the root systems. The Contractor shall wrap the area of the trunk of the tree with burlap prior to armoring with 2x4 cladding. Cladding for tree trunks shall extend from the base of the tree to at least 8 feet (2.4 meters) from the base.

To the extent possible, temporary landscaped fencing shall be installed at the limit of tree canopy and shall be staked and maintained vertical for the length of the contract.

ITEM 102.511 & ITEM 102.521 (Continued)

Where excavation within canopy is unavoidable, the Contractor shall use equipment and methods that shall minimize damage to the tree roots, per recommendations of the Certified Arborist. Such methods may require root pruning prior to, as well as during, any excavation activities.

All fencing, trunk protection, branch protection, and woodchips shall be maintained throughout the duration of the contract. Protective fencing shall be repaired, and woodchip mulch replaced, as necessary during the duration of the contract at no additional cost.

Cutting and Pruning
Some pruning of roots and branches may be a necessary part of construction. Pruning will be performed on the same side of the tree that roots have been severed.

The Contractor shall retain the services of a Massachusetts State Certified Arborist to oversee any cutting of limbs, stem or roots of existing trees. All cuts shall be clean and executed with an approved tool. Under no circumstances shall excavation in the tree protection area be made with mechanical equipment that might damage the existing root systems.

Any tree root area exposed by construction shall be covered and watered immediately. Exposed tree roots shall be protected by dampened burlap at all times until they can be covered with soil.

Watering
Water each tree within the construction area where work is in progress twice per week until the surrounding soil of each tree is saturated for the duration of construction activities.

Removal of Protection
After all other construction activities are complete, but prior to final seeding, wood chips, temporary fencing, branch protection, and trunk protection materials shall be removed and disposed off-site by the Contractor at no additional cost.

Tree Damage
The Contractor shall be held responsible for the health and survival of the existing trees in the immediate vicinity of the of the construction area. Damage that, in the Engineer's opinion, can be remedied by corrective measures shall be repaired immediately. Broken limbs shall be pruned according to industry standards. Wounds shall not be painted. Trees or shrubs that are damaged irreparably shall, at the Engineer's discretion, be replaced per the requirements of Division I of these Special Provisions. Cost of replacement trees shall be borne by the Contractor.

ITEM 102.511 & ITEM 102.521 (Continued)

COMPENSATION

Where the plans show specific, individual trees to remain and where grading or other disturbance is shown within the drip line of these trees or where the Engineer determines that an individual tree must be protected, these trees shall be protected and paid for under Item 102.51 Individual Tree Protection per each tree protected.

Temporary landscape fence will be measured for payment by the foot of fence installed, complete in place.

Where the plans show specific, individual trees to remain and where grading or other disturbance is shown within the drip line of these trees or where the Engineer determines that an individual tree must be protected, these trees shall be protected and paid for under Item 102.51, Individual Tree Protection.

Payment under these items shall be scheduled throughout the length of contract: 30 percent of value shall be paid upon installation, 30 percent approximately halfway through the contract, and the remainder to be paid at the end of the contract after completion of construction operations that would disturb plants and after the protection materials have been removed and properly disposed of off-site by the Contractor.

Compensation for Individual Tree Protection will be paid for at the contract unit price per each under Item 102.51. This item shall include full compensation for all labor, equipment, materials, and incidentals for the satisfactory completion of the work, including the services of a certified arborist, water and fertilizer, and the subsequent removal and satisfactory disposal of the protective materials upon completion of the contract.

Where construction disturbance, such as grading activities, will occur within the limits of the canopy of groups of trees, these trees shall be protected and paid for under Item 102.52, Temporary Tree Protection Fence.

Temporary Tree Protection Fence will be paid for at the Contract unit price per foot. This item shall include full compensation for all labor, equipment, materials, and incidentals for the satisfactory completion of the work, including the services of a certified arborist, water and fertilizer, and the subsequent removal and satisfactory disposal of the protective materials upon completion of the contract.

Cost of wood chips, as required, shall be incidental to these items.

ITEM 114.1 DEMOLITION OF CULVERT LUMP SUM

The work under this Item shall conform to the relevant provisions of Section 112, 120, and 140 of the Standard Specifications, amended and or supplemented as follows:

The work to be done under this Item consists of the removal and satisfactory disposal of the existing concrete culvert. This includes but is not limited to the concrete culvert, headwalls and wingwalls.

The Contractor shall be responsible for investigating the site to verify the extent of work prior to preparing the bid.

The Contractor shall submit his proposed method of demolition including equipment, tools, devices, etc. to the Engineer for approval. The demolition procedure and any necessary calculations and drawings shall be stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. Work under this Item may not commence until the Engineer has given written approval of the method of demolition.

No debris shall be allowed to fall on or adjacent to the existing stream and adjacent slopes and riverbanks. The Contractor shall be responsible for immediately removing all debris that falls on the ground or in the waterways during the demolition of the existing structure.

All materials removed under this Item shall become the property of the Contractor and shall be disposed of away from the work site.

Basis of Payment

Unless otherwise covered under other Contract Items, full payment for this work shall be included under the lump sum price for Item 114.1 and shall include all labor, equipment, and materials necessary to complete the work.

ITEM 153. CONTROLLED DENSITY FILL – EXCAVATABLE CUBIC YARD

Controlled density fill (CDF) shall be used to backfill excavations and trenches for conduit constructed in existing pavement areas that are to remain or be cold planed and overlaid. Controlled density fill shall not be used to backfill utility excavations or trenches in areas of full depth pavement construction.

Controlled density fill shall conform to the requirements of Section M4.08.0 Type 1E.

Controlled density fill will be measured for payment by the cubic yard of material used within the pay lines shown on the plans and as follows:

- the width of drainage (and water) trenches will be the inside diameter of the pipe plus two (2) feet

- the length and width of standard diameter drainage structure excavations will be eight (8) feet by eight (8) feet.

- the depths shall be from the bottom of the pipe barrel or structure to the proposed pavement subgrade or to the actual surface directed by the Engineer.

- the volume of pipes and structures will not be included in the quantity to be paid for.

Controlled density fill will be paid for at the Contract unit price per cubic yard, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

ITEM 201.	**CATCH BASIN**	**EACH**
ITEM 202.	**MANHOLE**	**EACH**
ITEM 203.	**SPECIAL MANHOLE**	**EACH**

Work under these Items shall conform to Section 200 of the Standard Specifications and include all excavation and materials required for the installation of the drainage structures, exclusive of castings.

Manholes and catch basins shall be constructed of precast sections or constructed of cement concrete blocks and mortar. Flat top sections shall be substituted for conical sections in areas of low cover. Flat top structures shall have a minimum 28-day compressive strength of 35 MPa, reinforced for AASHTO MS18 loading with ASTM A615M-90, Grade 400 reinforcing bars. No additional payment will be made for flat top structures or cement concrete block structures.

Manholes steps shall be of cast aluminum alloy 6061-T6, cast-in-place or installed utilizing inserts if approved by the Engineer. All steps shall be 300 mm on center with abrasive step surface and safety edge, drop front design, 25 mm diameter and 400 mm wide. Metal items embedded in concrete shall be painted with a zinc chromate primer.

Item 203. Special Manhole shall conform to all previous specifications listed and have a diameter of 6’.

Payment under these Items shall be at the Contract Unit Price Bid per each, complete in place, and shall include all excavation, shoring, bracing, bedding, and gravel backfill.

ITEM 302.06	**6 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET)**	**FOOT**
ITEM 302.12	**12 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET)**	**FOOT**
ITEM 303.12	**12 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)**	**FOOT**
ITEM 309.	**DUCTILE IRON FITTINGS FOR WATER PIPE**	**POUND**
ITEM 350.066	**INCH GATE AND GATE BOX**	**EACH**
ITEM 350.12	**12 INCH GATE AND GATE BOX**	**EACH**
ITEM 358.	**GATE BOX ADJUSTED**	**EACH**
ITEM 371.06	**6 INCH COUPLING**	**EACH**
ITEM 371.12	**12 INCH COUPLING**	**EACH**
ITEM 376.	**HYDRANT**	**EACH**
ITEM 376.2	**HYDRANT - REMOVED AND RESET**	**EACH**

The work under these items shall conform to the relevant provisions of Section 300 of the Standard Specifications, the North Carver Water District Rules and Regulations (Attachment B), and the following:

The work shall include the furnishing and installation of all materials required for the new 12" water main proposed on Montello Street with two 12" service stubs, two new hydrants on Montello Street, and the removal and resetting of an existing hydrant on Main Street (Route 58) as shown on the plans.

Approval of Materials

The Contractor shall submit the names of the material suppliers, shop drawings, and certificates of compliance to the Engineer for approval prior to ordering any materials.

Pipe and Fittings

All installations, including tapping of water mains, shall be performed only by authorized contractors who are listed and approved by the North Carver Water District. All costs of the service installation, including required system fees and inspection fees, will be at the expense of the Contractor.

In addition to the requirement contained in the North Carver Water District Rules and Regulations (Attachment B) sections PIPE and PIPE FITTINGS, the following applies:

Pipe shall be connected by push-on rubber gasket except in the vicinity of the proposed culvert from STA 110+50 to STA 111+75 and at any bends, fittings, etc. where restrained mechanical joint pipe is required per these Special Provisions and as directed by the Engineer.

Rubber gaskets for mechanical joints shall conform to ANSI A21.11/AWWA C111.

Pipe shall be supplied in lengths not exceeding 20 feet. Each pipe and fitting shall have markings cast into the metal in accordance with ANSI A21.10/AWWA C110, including manufacturer's identification, country material was made in, pressure rating, nominal diameter, and degrees or fraction of circle (for bends).

ITEM 302.06 through ITEM 376.2 (Continued)

Bedding Material

The water line shall be set on ¾" crushed stone along its entire length due to the high water table in the area.

Pipe and Fittings Installation

All pipes and fittings shall be inspected and approved by the North Carver Water District prior to backfilling.

The Contractor shall make all necessary arrangements with the Town of Carver Department of Public Works, the Carver Fire Department, and the North Carver Water District for the necessary shutdowns of service.

The North Carver Water District may establish the time of shutdown to be within the normal daily low demand period.

Care shall be taken in loading, transporting, and unloading to prevent injury to the pipes, fittings or coatings. Pipe and fittings shall not be dropped. All pipe or fittings shall be examined before laying and no piece that is found to be defective shall be installed. Any damage to the pipe coatings shall be repaired as directed by the Engineer. Any pipe found to be defective, before or after laying, shall be satisfactorily removed and replaced with sound pipe at no additional cost to the Town.

All pipe and fittings shall be installed in conformance with AWWA Standard Specifications C600, except as otherwise provided herein. All pipe and fittings shall be sound and clean before laying and shall be laid on a shaped bedding providing uniform, firm support over the entire length of each section barrel. BLOCKING WILL NOT BE PERMITTED. The ¾" crushed stone bedding material shall be placed and tamped along the sides of the pipe to complete the bedding.

Pipe shall be laid with good alignment and at a uniform 5-foot depth to top of pipe below proposed grade except where extra depth is required to clear other utilities and to connect to existing pipes, valves, or fittings. Joint deflection shall not exceed that recommended by the manufacturer. Additional fittings shall be furnished and installed as required to cross existing utilities. Solid sleeves shall be used only where approved by the Engineer and the North Carver Water District.

When pipe laying is stopped for any length of time, including short periods, the open ends of the pipe and fittings shall be immediately closed with a watertight plug or cap as approved by the Engineer and the North Carver Water District.

Necessary pipe cutting shall be accomplished by power saw and shall leave a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be used with a push-on bell shall be beveled to conform to the manufactured spigot end. Cement lining shall be undamaged.

ITEM 302.06 through ITEM 376.2 (Continued)

Push-on joints shall be made in strict accordance with the manufacturer's instructions. The rubber gasket shall be inserted in the groove of the bell end of the pipe, the joint surfaces cleaned and lubricated. The plain end of the pipe to be entered shall then be inserted in alignment with the bell of the pipe to which it is to be joined and pushed home with a jack or by other means.

After jointing the pipe, a metal feeler shall be used to make certain that the rubber gasket is correctly located.

Mechanical joints shall be installed in accordance with the "Notes of Method of Installation" of ANSI A21.11 and the instructions of the manufacturer. The Contractor shall thoroughly clean the joint surfaces and rubber gasket with soapy water before tightening the bolts. Bolts shall be tight to the specified torques. Extension wrenches or pipe over handle or ordinary ratchet wrench shall not be used to secure greater leverage.

The Contractor will be responsible for providing as-built drawings of the installation, including stations, offsets, and elevations of the pipe and fittings.

Valves

In addition to the requirement contained in the North Carver Water District Rules and Regulations (Attachment B) section VALVES, the following applies:

All valves shall open **RIGHT (CLOCKWISE)** as required by the North Carver Water District.

Couplings

In addition to the requirement contained in the North Carver Water District Rules and Regulations (Attachment B) section COUPLINGS, the following applies:

Couplings shall be approved by the North Carver Water District before use.

Couplings shall be used to (1) repair split pipe or replace sections of damaged pipe; (2) install or cut-in hydrants or valves into a water main; (3) couple different pipe types; and (4) correct misaligned pipe ends. Couplings shall have a pressure rating of 250 psi or greater. Materials shall be manufactured in accordance with the following:

(1) Center and end rings: ASTM-A536
(2) Gaskets: ASTM D2000
(3) Bolts & Hex Nuts: AWWA C111

Couplings shall be epoxy-coated.

ITEM 302.06 through ITEM 376.2 (Continued)

Pipe Insulation & Casing

Pipe insulation shall be installed in locations indicated on the plans and when water main cannot be installed with at least 5 feet of cover. Pipe insulation shall be installed with waterproof jacket in accordance with MASSDOT M11.0 and MASSDOT Section 301.60. Insulation thickness shall be as approved by the Engineer and the North Carver Water District.

The water pipe shall be insulated between the culvert footing walls, and any other location where 5' minimum depth cannot be attained, with FOAMGLAS® pipe shells and protected with PITTWRAP® SS jacketing.

The 12" water line on Montello Street shall be encased in a 24" galvanized metal sleeve along the entire portion that is insulated through the culvert. The 24" galvanized steel sleeve will be paid under Item 325.24 – 24 INCH STEEL PIPE CASING FOR WATER PIPE.

Hydrants

In addition to the requirement contained in the North Carver Water District Rules and Regulations (Attachment B) section HYDRANTS, the following applies:

Hydrants shall open by turning an operating nut to the **LEFT (COUNTERCLOCKWISE)** as required by the North Carver Water District and must be marked with an arrow and word "OPEN" to indicate the direction to turn stem to open hydrant.

Hydrants shall be set at the locations shown on the drawings, or as directed by the Engineer, and bedded on a firm foundation. A drainage pit 2 feet 6 inches in diameter shall be backfilled with crushed stone in conformance to M2.01.1 and satisfactorily compacted. Additional stone shall be brought up and around 6 inches over the drain ports. Each hydrant shall be set in true vertical alignment and properly braced. A concrete thrust block shall be placed between the back of the hydrant inlet and undisturbed soil at the end of the trench. Felt roofing paper shall be placed around hydrant elbow before placing concrete. Care shall be taken to ensure that concrete does not plug the drain ports. Hydrant paint shall be touched up as required after installation.

Item 376.2 – Hydrant Removed & Reset includes the pipe and fittings necessary to complete the hydrant relocation and the pipe and fitting should be included in the price bid for this item.

Thrust Restraints

Thrust restraints shall be installed at all tees, bends, plugs, caps, tapping sleeves, and other locations as directed by the Engineer in accordance with the dimensions and details shown on the plans.

Whenever water pipes can be placed against undisturbed earth, concrete thrust blocks may be installed. The back of thrust blocks shall be placed against undisturbed earth and the sides shall be

formed. Felt roofing paper shall be placed to protect pipe joints. Concrete shall not be placed over bolts or nuts, or in a manner which prevents the removal of joints.

Concrete shall have a minimum strength class of 3,000 psi.

Whenever water pipes are installed within fill sections, the Contractor shall use mechanical restrained joint pipe and wedge-type mechanical joint restraints rated for 350 psi.

MEASUREMENT AND PAYMENT

No separate payment will be made for excavation, concrete, gravel borrow and crushed stone bedding and backfill, insulation, sampling, flushing, testing, disinfection, fees, and as-builts, but all costs in connection therewith shall be included in the unit prices bid for the respective items.

No separate payment will be made for the removal, transporting, and stacking of existing salvaged materials, but all costs in connection therewith shall be included in the unit prices bid for the respective items.

De-watering will be paid for separately under Item 991.01 Control of Water.

ITEM 325.08 8 INCH STEEL PIPE CASING FOR WATER PIPE FOOT
ITEM 325.24 24 INCH STEEL PIPE CASING FOR WATER PIPE FOOT

These items shall be used as casing for the water and gas lines running through the culvert walls on Montello Street. The steel pipes selected shall be galvanized in accordance with industry standards.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Measurement for these items shall be per foot, installed and in place, as measured along the center of the pipe. Payment for this item shall include all labor, materials, equipment, and incidental costs required to complete the work. All fittings and accessories shall be considered incidental to the cost of these items.

ITEM 470.1 HOT MIX ASPHALT BERM FOOT

The work under this item shall conform to the relevant provisions of Section 470 of the Standard Specifications and the following:

Hot mix asphalt berm shall be constructed by means of an approved extrusion machine in conformance with the dimensions and at the locations shown on the plans.

Prior to placing the HMA berm, the surface shall be swept clean and RS-1 asphalt emulsion shall be applied to the surface.

Hot mix asphalt berm will be measured for payment by the foot, complete in place, along the gutter line.

Hot mix asphalt berm will be paid for at the Contract unit price per foot, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

ITEM 504.2 GRANITE CURB TYPE VA4 - SPLAYED END EACH

Work under this item shall conform to the relevant provisions of Section 501 of the Standard Specifications and the following:

The work shall include furnishing and installing curb transition sections at the locations shown on the plans to match into the proposed or existing edge. The curbing shall be type VA-4 and shall have a minimum length of six foot- six inches (6'-6"). The curb shall be sawcut to match into the proposed adjacent granite curb at one end and the opposite end shall match into the proposed hot mix asphalt berm as shown on the plans.

Granite curb Type VA-4 - Splayed End will be measured for payment as a unit complete in place.

Granite Curb Type VA-4 - Splayed End will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

ITEM 697.1 **SILT SACK** **EACH**

Work under this item shall conform to the relevant provisions of Sections 227 and 670 of the Standard Specifications and the following:

The work under this item includes the furnishing, installation, maintenance and removal of a reusable fabric sack to be installed in drainage structures for the protection of wetlands and other resource areas and the prevention of silt and sediment from the construction site from entering the storm water collection system. Devices shall be ACF Environmental (800)-448-3636; Reed & Graham, Inc. Geosynthetics (888)-381-0800; The BMP Store (800)-644-9223; or approved equal.

CONSTRUCTION

Silt sacks shall be installed in all proposed and retained catch basins and drop inlets within the project limits and as required by the Resident Engineer.

The silt sack shall be as manufactured to fit the opening of the drainage structure under regular flow conditions and shall be mounted under the grate. The insert shall be secured from the surface such that the grate can be removed without the insert discharging into the structure. The filter material shall be installed and maintained in accordance with the manufacturer's written literature and as directed by the Engineer.

Silt sacks shall remain in place until the placement of the pavement overlay or top course and the graded areas have become permanently stabilized by vegetative growth. All materials used for the filter fabric will become the property of the Contractor and shall be removed from the site.

The Contractor shall inspect the condition of silt sacks after each rainstorm and during major rain events. Silt sacks shall be cleaned periodically to remove and dispose of accumulated debris as required. Silt sacks, which become damaged during construction operations, shall be repaired or replaced immediately at no additional cost to the Department.

When emptying the silt sack, the contractor shall take all due care to prevent sediment from entering the structure. Any silt or other debris found in the drainage system at the end of construction shall be removed at the Contractors expense. The silt and sediment from the silt sack shall be legally disposed of offsite. Under no condition shall silt and sediment from the insert be deposited on site and used in construction.

All curb openings shall be blocked to prevent stormwater from bypassing the device.

All debris accumulated in silt sacks shall be handled and disposed of as specified in Section 227 of the Standard Specifications

ITEM 715.1. MAILBOX REMOVED AND RESET EACH

Residential mailboxes to be relocated shall be carefully removed and reset using the same embedment depth and foundation size as the existing mailbox at the start of construction. The Contractor is responsible for the repair or replacement of any mailbox components that are damaged during construction.

Mailbox Removed and Reset will be measured for payment as a unit complete in place.

Mailbox Removed and Reset will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

ITEM 755.35 INLAND WETLAND REPLICATION AREA LUMP SUM

The 2,200 SF wetland replication area off of Montello Street shall be constructed according to the notes on Sheet 13 of the Plans.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 755.35 will be paid at the contract price bid per lump sum. The bid price shall include all excavation, soil, seed mixtures, wetland plants and plant installation, and wetland scientist services necessary to complete the work.

Such payment shall be considered full compensation for all labor, tools, equipment, materials, travel and incidentals necessary to complete the work as described herein in a manner satisfactory to the Engineer. Cost shall be full compensation for the work described on Sheet 13 of the Plans, including surveying of areas and existing conditions, stockpiling and protection of excavated existing wetland soil, re-handling and spreading of acceptable wetland soil or muck, provision and placement of any new wetland soil materials, grading, fine grading, dewatering, sediment and erosion control, and protection of the work and all inspections and reports. The cost shall also be full compensation for wetland seeding, plantings, fertilizer, watering, and treatment of invasive species, inspections, and all incidental costs for the satisfactory establishment of the wetland replacement area.

ITEM 756. NPDES STORM WATER POLLUTION PREVENTION PLAN LUMP SUM

This Item addresses the preparation and implementation of a Storm Water Pollution Prevention Plan required by the National Pollutant Discharge Elimination System (NPDES) and applicable Construction General Permit (CGP) issued by the U.S. Environmental Protection Agency (EPA).

The term "The Owner" and "the Engineer" refers to the property developer and their engineer for the remainder of this specification unless otherwise stated.

Pursuant to the Federal Clean Water Act, construction activities which disturb one acre or more are required to apply to the EPA for coverage under the NPDES General Permit for Storm Water Discharges from Construction Activities. On February 16, 2012 (77 FR 12286), EPA issued the final NPDES Construction General Permit (CGP) for construction activity. The Contractor shall be fully responsible for compliance with the CGP. Should a fine or penalty be assessed against it, or The Owner, as a result of a local, state, or federal enforcement action due to non-compliance with the CGP, the Contractor shall take full responsibility.

The NPDES CGP requires the submission of a Notice of Intent (NOI) to the EPA prior to the start of construction (defined as any activity which disturbs land, including clearing and grubbing). There is a 14-day review period commencing from the date on which EPA enters the Notice into their database. The Contractor is advised that, based on the review of the NOI, EPA may require additional information, including but not limited to, the submission of the Storm Water Pollution Prevention Plan (SWPPP) for review. Work may not commence on the project until final authorization has been granted by EPA. Any additional time required by EPA for review of submittals will not constitute a basis for claim of delay.

In addition, if the project discharges to an Outstanding Resource Water, vernal pool, or is within a coastal ACEC as identified by the Massachusetts Department of Environmental Protection (DEP), a separate notification to DEP is required. DEP may also require submission of the Storm Water Pollution Prevention Plan for review and approval. Filing fees associated with the notification to DEP and, if required, the SWPPP filing to DEP shall be paid by the Contractor.

The CGP also requires the preparation and implementation of a SWPPP in accordance with the afore-mentioned statutes and regulations. The Plan will include the CGP conditions and detailed descriptions of controls of erosion and sedimentation to be implemented during construction. It is the responsibility of the Contractor to prepare the SWPPP to meet the requirements of the most recently issued CGP. The Contractor shall submit the Plan to the Engineer for approval at least 4 weeks prior to any site activities. It is the responsibility of the Contractor to comply with the CGP conditions and the conditions of any state Wetlands Protection Act Order, Water Quality Certification, Corps of Engineers Section 404 Permit and other environmental permits applicable to the project and to include in the SWPPP the methods and means necessary to comply with applicable conditions of said permits (reference to Part 9.1.1 of the 2012 CGP).

ITEM 756. (Continued)

It is the responsibility of the Contractor to complete the SWPPP in accordance with the EPA CGP, provide all information required, and obtain any and all certifications as required by the CGP. Any amendments to the SWPPP required by site conditions, schedule changes, revised work, construction methodologies, and the like are the responsibility of the Contractor. Amendments will require the approval of the Engineer prior to implementation.

Included in the CGP conditions is the requirement for inspection of all erosion controls and site conditions on a weekly basis as well as after each incidence of rainfall exceeding 0.25 inches in twenty-four hours. For multi-day storms, EPA requires that an inspection must be performed during or after the first day of the event and after the end of the event. The CGP requires that inspections be performed by a qualified individual. The Owner requires proof of completion of a 4-hour minimum sedimentation and erosion control training class current to the latest CGP. This individual can be, but not limited to, someone that is either a certified inspector, certified professional, or certified storm water inspector. The documentation shall be included as an appendix in the SWPPP. The Engineer must approve the contractor's inspector. This individual shall be on-site during construction to perform these inspections. In addition, if the Engineer determines at any time that the inspector's performance is inadequate, the Contractor shall provide an alternate inspector. Written weekly inspection forms, storm event inspection forms, and Monthly Summary Reports must be completed and provided to the Engineer. Monthly Summary Reports must include a summary of construction activities undertaken during the reporting period, general site conditions, erosion control maintenance and corrective actions taken, the anticipated schedule of construction activities for the next reporting period, any SWPPP amendments, and representative photographs.

The Contractor is responsible for preparation of the Plan, all SWPPP certifications, inspections, reports and any and all corrective actions necessary to comply with the provisions of the CGP. Work associated with performance of inspections is not included under this Item. The Standard Specifications require adequate erosion control for the duration of the Contract. All Control measures must be properly selected, installed, and maintained in accordance with manufacturer specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately or is no longer adequate, it is the responsibility of the Contractor to replace or modify the control for site conditions at no additional cost to the Owner. The Contractor must maintain all control measures and other protective measures in effective operating condition and shall consider replacement of erosion controls for each construction season.

This Item addresses acceptable completion of the SWPPP, any revisions/amendments required during construction, and preparation of monthly reports. In addition, any erosion controls beyond those specified in bid items elsewhere in this contract which are selected by the Contractor to facilitate and/or address the Contractor's schedule, methods and prosecution of the work shall be considered incidental to this item.

ITEM 756. (Continued)

The Contractor is advised The CGP provides specific requirements for temporary and final stabilization. This shall be incorporated into the project schedule. The permit defines specific deadline requirements for Initial Stabilization ("immediately", i.e., no later than the end of the next work day following the day when earth-disturbing activities have temporarily or permanently ceased) and for Complete Stabilization Activities (no later than 14 calendar days after the initiation of stabilization). Stabilization criteria for vegetative and non-vegetative measures are provided in the CGP.

The CGP requires the submission of a Notice of Termination (NOT) from all operators when final stabilization has been achieved, as well as removal and proper disposal of all construction materials, waste and waste handling devices, removal of all equipment and construction vehicles, removal of all temporary stormwater controls, etcetera. Approval of final stabilization by the Engineer and confirmation of submission of the NOT will be required prior to submission of the Resident Engineer's Final Estimate. The permittee is required to use EPA's electronic NOI system or "eNOI system" to prepare and submit NOT. The electronic NOT form can be found at www.epa.gov/npdes/stormwater/cgpenoi. If you are given approval by the EPA Regional Office to use a paper NOT, you must complete the form in Appendix K of the 2012 CGP.

Compensation

Payment for all work under this Item shall be made at the contract unit price, lump sum, which shall include all work detailed above, including plan preparation, required revisions, revisions/addenda during construction, monthly reports and filing fees.

Payment of 50% of the contract price shall be made upon acceptance of the Storm Water Pollution Prevention plan. Payment of 40% of the contract price shall be made in equal installments for implementation of the Stormwater Pollution Prevention plan. Payment of the final 10% of the contract price shall be paid upon satisfactory submissions of a Notice of Termination (NOT) when final stabilization has been achieved.

ITEM 757.1 SUBSURFACE GRAVEL WETLAND #1 LUMP SUM
ITEM 757.2 SUBSURFACE GRAVEL WETLAND #2 LUMP SUM

The work to be done under this section includes excavating, dewatering, fine grading and the provisions and installation of wetland soil and plants as shown on the plans and as directed by the Engineer. The work under this item shall conform to the relevant provisions of Sections 120, 150, 765, 770, 771, and the following:

DESCRIPTION

The subsurface gravel wetlands, as shown on the Plans and Details, shall be constructed in accordance with the Massachusetts Stormwater Management Standards and as directed by the Engineer and a Wetland Specialist. Limits of the subsurface gravel wetlands and proposed plantings shown on the plans are approximate and may require adjustment in the field to accommodate actual conditions.

Subsurface gravel wetlands have been designed as treatment BMP's to maximize the removal of pollutants from stormwater runoff through wetland vegetation uptake. The Contractor shall retain the services of a Wetland Specialist, Biologist, Botanist, or other individual (hereafter referred to as Wetland Specialist) with similar qualifications and a minimum of 10 years' experience in similar wetland design, and thoroughly versed in the Commonwealth of Massachusetts Wetlands Protection Act (MGL C.131, s.40) and all other relevant regulations of the Department of Environmental Protection and the U.S. Army Corps of Engineers, New England District.

Wetland Specialist shall review all environmental permits; evaluate site, conditions and materials prior to construction. Wetland Specialist shall be responsible for approving the following activities:

- final location of wetland area and limits
- final grading prior to planting and seeding
- limits of wetland and upland seeding prior to seeding
- wetland plant locations prior to installation
- monitoring for invasive species during establishment period and until final acceptance
- monthly monitoring reports

The definition of invasive species referred to herein shall be as defined by Massachusetts Invasive Plant Advisory Group (MIPAG): "non-native species that have spread into native or minimally managed plant systems in Massachusetts, causing economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems." In addition, invasive species shall include those listed by the U.S. Army Corps of Engineers, New England District.

ITEMS 757.1 AND 757.2 (Continued)

MATERIALS

Gravel Borrow – Type C. Shall conform to the relevant provisions of Section 150 of the Standard Specifications.

Peastone. Shall conform to the relevant provisions of Section 150 of the Standard Specifications, Coarse aggregate for subsurface gravel wetland facilities shall consist of clean, tough, durable fragments of crushed stone conforming to the gradations specified on the design plans: AASHTO No. 8 Stone (nominal size 3/8 inch; M2.01.6) for peastone course.

Double washed crushed stone. Shall conform to the relevant provisions of Section 150 of the Standard Specifications, Coarse aggregate for subsurface gravel wetland facilities shall consist of clean, tough, durable fragments of crushed stone conforming to the gradations specified on the design plans: AASHTO No. 57 Stone (nominal size 3/4 inch; M2.01.4) for subsurface gravel wetland course. Coarse aggregate shall also meet the following:

a. Be double-washed, sufficient to remove dust and other coatings; and
b. Be free from clay balls, organic matter, and other deleterious substances.

6-inch Polyvinyl Chloride Drain Pipe and 6-inch Perforated Polyvinyl Chloride Drain Pipe. Includes the provision and installation of polyvinylchloride drain pipe for subsurface gravel wetland underdrain, cleanout, overflow riser, and outlet pipe at the locations shown on the plans, as described hereunder and as directed by the engineer.

Polyvinylchloride (PVC) drain pipe shall be schedule 40 pressure pipe conforming to ASTM D-2665 specification for PVC plastic drain, waste and vent pipe and conforming to ASTM D-1784 specification for Type 1, Grade 1 PVC material used in the manufacturing of this pipe..

For subsurface gravel wetland underdrain, Item 251.061, perforations shall be 3/4 inch holes on 5 inch centers and in two rows 120 degrees apart. The perforated holes shall be installed at the 4 o'clock and 8 o'clock positions. Perforated pipe shall be fitted at the end with end cap or plug.

For subsurface gravel wetland cleanout, a 6-inch PVC drain pipe shall be fitted with screw cap set 24 inches above finished grade. Screw cap shall be threaded PVC with 2-inch square lug. Vertical pipe shall be connected to 6-inch perforated PVC drain pipe using the appropriate PVC reducer fittings, tees, and/or elbows.

Wetland Soil. As native hydric soils are not anticipated to be available for use, a soil mixture will be used for wetland soil. Wetland soil that is not purchased pre-blended shall consist of a 1:1 mixture (or equal volumes) of organic and mineral soil material (loam, loamy sand to silt loam range) that contains 7-12 percent organic matter content by weight. Clean leaf or commercially available compost is the preferred amendment to achieve this standard, though other materials may be used if approved by the wetland scientist. Pre-blended wetland soil shall also contain 7-12 percent organic matter content by weight.

ITEMS 757.1 AND 757.2 (Continued)

Compost mixed into offsite stockpiled soils shall be derived from organic wastes including sawdust, clean ground wood, leaf and yard residues, and biosolids that meet the Massachusetts Department of Environmental Protection (DEP) requirements for composting facilities and use of biosolids. The product shall be well composted, free of viable weed seeds and contain material of a generally humus nature capable of sustaining growth of vegetation, with no materials toxic to plant growth.

Compost shall have the following properties:

Parameters	Range
pH	5.5 - 8.0
Moisture Content	35% - 55%
Soluble Salts	< 4.0 mmhos (dS)
C:N Ratio	15 - 30:1
Particle Size	< ¾"
Organic Matter Content	> 20%
Bulk Density	< 1200 lbs./cubic yard
Foreign Matter	< 1% (dry weight)

Compost generator shall also provide minimum available nitrogen and other macro and micronutrients to determine fertilizer requirements.

No soil, compost, or other soil amendment imported to the work site shall contain seeds, roots, stems, or other viable parts of invasive plants. No soil or soil amendment shall be brought on site without prior approval of the material source. Soils used in the stormwater wetland area should be free of rocks greater than 4 inches in diameter.

Seeding. Subsurface gravel wetland seed mix comprised of native New England species at the rates and percentages specified by the supplier.

Seeding – Basin Mix:
Seed in the Subsurface gravel wetland Areas shall conform the provisions of Section 765 of the Standard Specifications, using the following seed mix

BOTANICAL NAME	COMMON NAME
Carex vulpinoidea	Fox Sedge
Carex scoparia	Blunt Broom Sedge
Carex lurida	Lurid (Shallow) Sedge
Carex lupulina	Hop Sedge
Poa palustris	Fowl Bluegrass
Bidens frondosa	Beggar Ticks
Scirpus atrovirens	Green Bulrush
Asclepias incarnata	Swamp Milkweed

ITEMS 757.1 AND 757.2 (Continued)

BOTANICAL NAME	COMMON NAME
Carex crinita	Fringed Sedge
Vernonia noveboracensis	New York Ironweed
Juncus effusus	Soft Rush
Aster lateriflorus (Symphyotrichum lateriflorum)	Starved/Calico Aster
Iris versicolor	Blue Flag
Glyceria grandis	American Mannagrass
Mimulus ringens	Square Stemmed Monkey Flower
Eupatorium maculatum (Eutrochium maculatum	Spotted Joe Pye Weed

The wetland seed mixture shall be reviewed and approved by the Wetland Specialist.

SUBMITTALS

Prior to beginning work, the Wetland Specialist shall furnish proof of qualifications to the Engineer for approval.

Soils. Contractor shall submit for approval all sources of loam and compost and all other soil amendments prior to ordering. Soils brought in from off-site shall be free of invasive species.

Off-site source shall be identified and available for inspection by the Wetland Specialist prior to transport of soil to the site.

Seed. At least 30 days prior to ordering, the Contractor shall submit to the Wetland Specialist seed packing certificates with source and date, as well as material specifications for all mulch materials. No material shall be ordered until submittals have been approved by the Engineer. Delivered materials shall match approved materials. All substitutions shall be approved by the Wetland Specialist.

Seed shall be brought to the site in unopened bags, whereupon the Wetland Specialist shall collect certification from bag prior to opening bag and prior to any seeding activity. In addition, a manufacturer's Certificate of Compliance shall be submitted with each seed shipment. These Certificates shall include the guaranteed percentages of Pure Live Seed, based on purity and germination rates, as well as the net weight, harvest, and shipment dates.

Quantities specified are Pure Live Seed (PLS). Greater quantities of ordered seed may be required to achieve actual specified seeding rates. Pure Live Seed is defined as the fraction of pure seed species within the mix that, by standard seed testing practices, will germinate. This is determined by multiplying the percent of seed purity by the percent of seed germination.

Sediment Control Barriers/Berms
Sediment control barriers shall conform to the requirements of Section 767 of the Standard Specifications and to the Special Provision for Sediment control barriers.

CONSTRUCTION METHODS

Site Preparation
All trees, stumps, brush and other removed vegetation shall become the property of the Contractor to be legally disposed of off site or recycled for use.

The Contractor shall plan and execute operations in such a manner that the amount of excavated and exposed fill is minimized and foreign materials are prevented from being washed or otherwise carried into the Subsurface gravel wetland area or into nearby wetland resource areas.

The Contractor shall plan and execute operations in such a manner that the amount of excavated and exposed fill is minimized and foreign materials are prevented from being washed or otherwise carried into the Subsurface gravel wetland area or into nearby wetland resource areas. The sedimentation control barrier shall act as a limit of work barrier for all heavy equipment.

Dewatering
The Contractor shall use a dewatering system when necessary for the establishment of a Subsurface gravel wetland. Dewatering includes the control of surface water runoff and subsurface water (i.e. groundwater) to prevent flooding of excavations, trenches, and adjacent properties. The work also includes the provision of equipment and facilities to remove sediment and control the rates and volumes of disposal of surface and subsurface water removed from the work areas.

The Contractor shall design, provide, install, and operate the dewatering system. The Engineer shall approve the design prior to procurement or installation of same. The Contractor shall design the water management systems to effectively reduce the hydrostatic pressure and lower the groundwater levels when necessary and develop a substantially dry and stable subgrade for the establishment of Subsurface gravel wetlands. The Contractor shall be responsible for proper collection and discharge of stormwater runoff from existing utilities during construction. The Contractor shall submit dewatering system sketches and equipment shop drawings to the Engineer.

The Contractor shall provide pumps and piping or hose capable of removing water from within the Limits of Excavation. The Contractor shall notify the Engineer whenever pumps are added or removed and provide sufficient pumps and piping or hose to dewater all areas necessary for the establishment of Subsurface gravel wetlands. The Contractor shall locate dewatering facilities where they will not interfere with utilities and construction work to be done by others, and modify dewatering equipment and procedures when operations are insufficient for the completion of work.

ITEMS 757.1 AND 757.2 (Continued)

The Contractor shall design, install, operate, and remove the dewatering systems in accordance with applicable federal, state, county and local Laws and Regulations, and generally accepted industry practices. The Contactor shall perform dewatering when necessary at no additional cost to the Owner. Pumping of large volumes of water from sumps in trenches or excavations, resulting in the movement of foundation soil material, will not be permitted.

The Contractor shall discharge water pumped from excavations in a manner which will not result in damage to adjacent properties. All damage resulting from the dewatering operations, or the failure of the Contractor to maintain the work in a suitably dry condition shall be repaired by the Contractor at no additional cost to the owner.

After the temporary works have served their purposed, the Contractor shall remove them or level and grade them to the extent required by the plans and to prevent any obstruction of the flow of water or any other interference with the operation of or access to the permanent work.

Erosion and Sediment Control

Stake out Subsurface gravel wetland boundaries in the field prior to excavation. Install Sediment control barriers between the Subsurface gravel wetland and the adjacent wetland. The siltation barrier shall be placed so that no excavated material or disturbed soil can enter adjacent wetlands or waters. The siltation barrier shall act as a limit of work barrier for all heavy equipment.

Filter tubes shall be sized and filled to achieve at least 12 inches in height. Bags shall be tamped to ensure good contact with soil. The Contractor shall maintain the filter tubes in a functional condition at all times, including inspections after each rainfall and at least daily during prolonged rainfall and shall immediately correct all deficiencies.

The Engineer and Wetland Specialist shall inspect and approve erosion and sediment control measures prior to excavation work. Contractor shall remove sediment deposits as necessary to maintain the filters in working condition.

Excavation. Final Subsurface gravel wetland areas shall be staked for approval prior to clearing and excavation. Environmental protection measures, including hay bales, silt fence or berms, shall be in place prior to any construction activities. Limits of stormwater wetland areas shall be adjusted to protect root systems of existing trees: limits shall be a minimum of 6 feet from trunk of trees to the extent possible.

The stormwater basin shall be excavated to a depth of 12 inches below the final design elevations. Minor modifications to this grading plan may be made in the field by the Wetland Specialist in response to hydrologic conditions. The supervising Wetland Specialist will inspect the sub-grade of the Subsurface gravel wetland areas to ensure that the proper hydrology has been established or is anticipated based upon expected surface/ground water levels.

ITEMS 757.1 AND 757.2 (Continued)

Backfill and Grading. The Engineer and Wetland Specialist will oversee all grading activities. Sequence and execution of work will ensure minimal compaction and that no heavy equipment travels over placed Subsurface gravel wetland soil.

Following excavation and grading of the site to sub-grade, and after the sub-grade elevations are approved by the Wetland Specialist, wetland soils shall be placed in two lifts over the Subsurface gravel wetland area as shown on the Plans and Cross Sections and/or as directed by the Wetland Specialist.

Contractor shall provide sufficient backfill to reach a depth not to exceed 12 inches. The finished elevations within the Subsurface gravel wetland shall be surveyed to ensure that the correct topography and hydrology are met. No breaks in elevation shall result upon removal of siltation barriers and other erosion-control devices.

Microtopography shall be created in the surface of the Subsurface gravel wetland area by either using low ground pressure equipment to gently push soil around to create high points and low points as shown on the plans by depositing additional wetland soil material in a pile and partially smoothing the soil out to create elevated and depressed areas. After placement of soil is complete, the soil surface shall be raked to a relatively smooth planting surface. If area has been dewatered, natural water levels shall be restored.

The erosion-control devices shall be removed after plants are established and in accordance with Order of Conditions issued and other environmental permits. The ground under the siltation barriers shall be reseeded with the approved wetland seed mix when the barriers are removed.

Once soils have been placed, no heavy equipment shall travel across the Subsurface gravel wetland.

Seeding. All seeding shall be done by a company having a minimum of five years of experience with native grass establishment. Prior to beginning work, the seeding Contractor shall furnish proof of qualifications to the Engineer for approval. Proof of qualifications includes, if requested, providing documentation (photos and contacts) to demonstrate knowledge and expertise with native seeding and proof of having completed successful native seeding projects.

Seeding shall be done within 48 hours of placement of loam and final grading. Mulch for seed shall be Compost Topdressing or hydromulch as specified below and shall be incidental to this item.

Seeding seasons shall be April 1 through May 15 and October 1 through December 1 for dormant seeding. ***Seeding that occurs outside of these periods, shall be increased by 50%***.

Seeding Rate: Species ecotype shall be as native to New England region as possible. Apply this mix at 20 lbs PLS/acre.

ITEMS 757.1 AND 757.2 (Continued)

Water, including hose and all other watering equipment required for the work, shall be furnished by the Contractor to the site at no additional cost. Water shall be suitable for irrigation and free from ingredients harmful to plant life. All plants injured or work damaged due to the lack of water or the use of too much water shall be the Contractor's responsibility to correct.

Removal of Erosion Protection Measures. Upon completion of all construction and once soils are stabilized with a uniform cover of vegetation, hay bales shall be removed and disposed of off-site. Contractor shall rake out filter berms (if used) so that filter material is no greater than 3 inches in depth on soil substrate. If filter has been wrapped in fabric or fabric bags, all bag material shall be cut and removed and disposed of off-site by the Contractor, at no additional cost to the project. Filter material shall then be raked out. Silt fence shall be removed in its entirety and disposed of properly as solid waste.

MAINTENANCE AND REPLACEMENTS

Completion Inspection. The Subsurface gravel wetlands shall be inspected by the Wetland Specialist following construction to document that they have been constructed such that it meets the intent of the design with regard to soils, grading, hydrologic connection, erosion control, plant species and quantities, and quality of plant material.

Long term monitoring and maintenance of the Subsurface gravel wetland basins shall be conducted in accordance with the stormwater management system's Long Term Pollution Prevention Plan.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Cost shall be full compensation for the work described above, including surveying of areas and existing conditions, stockpiling and protection of excavated existing wetland soil, provision and placement of any new wetland soil materials, grading, fine grading, dewatering and protection of the work and all inspections and reports. The cost shall also be full compensation for the provision and installation of gravel borrow, all piping and appurtenances, dense graded crushed stone, wetland seeding, watering, and treatment of invasive species, inspections, and all incidental costs for the satisfactory establishment of the Subsurface gravel wetland.

Ordinary borrow will be paid for under Item 150.

Sediment control barriers will be paid for under Item 767.121

ITEM 767.121 SEDIMENT CONTROL BARRIER FOOT

The work under this item shall conform to the relevant provisions of Sections 751 and 767 of the Standard Specifications and Section 670 of the Standard Supplemental Specifications and shall include the furnishing and placement of a sediment control barrier. Sediment Control Barrier shall be installed prior to disturbing upslope soil.

The purpose of the sediment control barrier is to slow runoff velocity and filter suspended sediments from storm water flow. Sediment barrier may be used to contain stockpile sediments, to break slope length, and to slow or prevent upgradient water or water off road surfaces from flowing into a work zone. Contractor shall be responsible for ensuring that barriers fulfill the intent of adequately controlling siltation and runoff.

Twelve-inch diameter (after installation) compost filter tubes are intended to be the primary sedimentation control barrier.

For small areas of disturbance with minimal slope and slope length, the Engineer may approve the following sediment control methods:

- Straw tubes/wattles which shall be trenched
- Straw bales which shall be trenched

Additional barriers (adding depth or height) shall be used at specific locations of concentrated flow such as at gully points, steep slopes, or identified failure points in the sediment capture line.

Where specified or required by permits, silt fence shall be used in addition to compost filter tubes or straw bales and shall be incidental to the item.

MATERIALS AND CONSTRUCTION

Prior to initial placement of barriers, the Contractor and the Engineer shall review locations specified on the plans to ensure that the placement will provide maximum effectiveness.

Barriers shall be staked, trenched and/or wedged as specified herein and shall be securely in contact with existing soil such that there is no flow beneath the barrier.

Compost Filter Tube

Compost material inside the filter tube shall meet M1.06.0, except for the following: no manure or bio-solids shall be used; no kiln-dried wood or construction debris shall be allowed; material shall pass through a 2-inch sieve; and the C:N ratio shall be disregarded.

Outer tube fabric shall be a knitted mesh with 1/8 - 3/8” openings and made of 100% biodegradable materials (i.e., cotton, hemp or jute).

ITEM 767.121 (Continued)

Compost filter tubes shall be a minimum of 12 inches in diameter installed. Tubes shall be placed, filled, and staked in place as required to ensure stability against water flows. All tubes shall be tamped, but not trenched, to ensure good contact with soil.

Where reinforcement is necessary, additional tubes shall be installed as shown on the plans.

Straw Bales

Straw bales shall conform to the requirements of Section M6.04.3 of the Standard Specifications and the following:

Bales should be a minimum size of 12 x 16 x 36 inches and shall be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another.

The bales shall be trenched and backfilled. The trench shall be excavated the width of the bale and the length of the proposed barrier to a depth of 4 inches. After the bales are staked the excavated soil shall be backfilled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be built up to 4 inches against the uphill side of the barrier.

Straw Wattle

Straw wattle shall be a minimum of 12 inches in diameter. Straw filling shall conform to the requirements of Section M6.04.3, shall be encased in durable netting, and shall have a density of 3 lb/foot.

Straw wattle shall be trenched in 3 inches deep and staked according to the plans. The wattles shall be sufficiently secure on the upstream side to prevent water flowing underneath the wattle.

Silt Fence

Materials and Installation shall be per Section 670.40 of the Standard Supplemental Specifications and the following:

Silt fence shall be used when specified by Orders of Condition or other permitting.

When used with compost filter tubes, the tube shall be placed on a minimum of 8 inches of folded fabric on the upslope side of the fence. Fabric does not need to be trenched.

When used with straw bales, an 8-inch deep and 4-inch wide trench or V-trench shall be dug on the upslope side of the fence line. One foot of fabric shall be placed in the bottom of the trench followed by backfilling with compacted earth or gravel. Stakes shall be driven 16 inches into the ground on the down slope side of the trench and shall be spaced such that the fence remains vertical and effective.

Width of fabric shall be sufficient to provide a 36-inch high barrier after fabric is folded or trenched. Sagging fabric will require additional staking or other anchoring.

ITEM 767.121 (Continued)

Stakes

Stakes for anchoring Compost Filter Tubes, Straw Wattles, and Straw Bales shall be as shown on the plans and shall be a minimum of 1x1 inch diameter x 4 feet hardwood stakes.

When used with Silt Fence, stakes for Compost Filter Tubes shall be driven 12 inches into the ground, Stakes for Straw Bales shall be driven 16 inches into the ground.

Stakes of other material of equivalent strength may be used if approved by the Engineer.

MAINTENANCE

Maintenance of Sediment Control Barriers shall be per Section 670.40 of the Standard Supplemental Specifications or per the Stormwater Pollution Prevention Plan (SWPPP).

The contractor shall inspect the sediment barrier after each rain event and as specified in relevant permits to ensure that they are working effectively and as intended. Contractor shall be responsible for ensuring that an effective barrier is in place for all phases of the contract.

Barriers that decompose naturally due to weatherization over time such that they no longer provide the function required shall be repaired or replaced as directed. If the resulting berm of compost within the fabric tube is sufficiently intact and continues to provide water and sediment control, barrier does not necessarily require replacement.

DISMANTLING & REMOVING

Barriers shall be dismantled and/or removed when construction work is complete and when site conditions are sufficiently stable to prevent surface erosion and after receiving permission to do so from the Engineer.

For all instances, all nonbiodegradable material, including photo-biodegradable fabric, plastic netting, nylon twine, and silt fence, shall be removed and disposed off-site by the Contractor regardless of site context.

For naturalized areas, biodegradable, natural fabric and material may be left in place to decompose on-site. Compost filter tubes may be left as they are with stakes removed. Straw bales shall be broken down and spread evenly. All nylon or nonbiodegradable twine shall be removed along with silt fence. Wooden stakes may be left on site, placed neatly and discretely.

ITEM 767.121 (Continued)

In urban, residential, and other locations where aesthetics is a concern, the following shall apply:

- Filter tube fabric shall be cut and removed, and compost shall be raked to blend evenly (similar to a soil amendment or mulch). Not more than a 2-inch depth shall be left on soil substrate.
- Straw bales shall be removed and disposed off-site by the Contractor. Areas of trenching shall be raked smooth and disturbed soils stabilized with a seed mix matching adjacent grasses (i.e., lawn or native grass mix).
- Silt fence, stakes, and other debris shall be removed and disposed off-site. Site shall look neat and clean upon completion.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 767.121 will be measured and paid for at the contract unit price per foot of sediment control barrier which price shall include all labor, equipment, materials, maintenance, dismantling, removal, restoration of soil, and all incidental costs required to complete the work.

Silt fence, when used in conjunction with compost filter tubes or straw bales, will be incidental to this item.

Additional barrier, such as double or triple stacking of compost filter tubes, shall be paid for per foot of tube installed.

Barriers that have been driven over or otherwise damage by construction activities shall be repaired or replaced as directed by the Engineer at the Contractors expense.

ITEM 772.335 **BALSAM FIR** **EACH**

The work under this item shall conform to the applicable requirements of Section 771 PLANTING TREES, SHRUBS AND GROUNDCOVER, of the Standard Specifications, latest edition, except as amended and supplemented as indicated on the drawings and as specified below.

The balsam fir trees selected shall be 5 to 6 feet in height when installed.

Item 772.335 will be measured and paid for at the contract unit price per each balsam fir which price shall include all labor, equipment, materials, maintenance, dismantling, removal, restoration of soil, and all incidental costs required to complete the work.

ITEM 804.3 **3-INCH ELECTRICAL CONDUIT TYPE NM PLASTIC (UL)** **FOOT**

The work under this Item shall conform to the relevant provisions of Section 801 of the Standard Specifications and the following:

The work shall include the furnishing and installation of 3-inch non-metallic conduit for the traffic signal system in accordance with the plans and as directed by the Engineer.

The conduit material shall be Schedule 80 polyvinyl chloride (PVC) plastic conduit.

The length of conduit estimated under this Item is not guaranteed by the Engineer; it may be increased or decreased by the Engineer depending upon actual conditions encountered as provided for in Section 4.06 of the Standard Specifications.

Where new conduits are installed in existing grass areas outside the limits of grading, the work shall include the placement of a minimum of 4 inches of topsoil and sod to restore the disturbed areas to their original condition. No separate payment will be made for this work, but all costs in connection therewith shall be included in the unit price bid.

Where conduit is installed in existing sidewalk or paved median areas to remain, the work shall include replacement of the gravel base material and the surface pavement to match preconstruction conditions. No separate payment will be made for this work, but all costs in connection therewith shall be included in the unit price bid.

Metallic warning tape shall be placed above the conduit as shown on the Construction Details.

A ¾-inch polypropylene pull rope shall be installed in all conduit.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Electrical Conduit will be paid for at the Contract unit price per foot, which price shall include sawcutting, excavation, controlled density fill-excavatable, gravel borrow, metallic warning tape, sand bedding, all labor, materials, equipment and incidental costs required to complete the work.

Hot mix asphalt trench patching will be paid for under Item 451. - HMA for Patching.

ITEM 815.1 TRAFFIC CONTROL SIGNAL LOCATION NO. 1 LUMP SUM

The work under this Item shall conform to the relevant provisions of Section 800 of the Standard Specifications, the 2009 edition of the Manual on Uniform Traffic Control Devices (MUTCD), and the following:

The work shall include the furnishing and installation of part or all of the following items: local traffic signal controller; cabinet and foundation; mast arm assemblies with anchor bolts and foundations; signal heads; backplates; video/radar vehicle detection system; emergency preemption; pull boxes; all cable and wiring; ground rods, equipment grounding and bonding; and all other equipment, materials and incidental costs necessary to provide complete, fully operational traffic control signal system as specific herein and as shown on the plans. The location is as follows:

- Main Street (Route 58) at Montello Street

Lists of the major traffic signal items required at this location is included on the plans.

Shop Drawings

Within 30 days following execution of the Contract, the Contractor shall submit shop drawings for signal supports, a list of equipment, and manufacturer's equipment specifications to the Engineer in accordance with the relevant provisions of Section 815.20.

No work shall be commenced by the Contractor until approval of the shop drawings and manufacturer's data has been received in writing from the Engineer. Approval of these drawings will be general in character and shall not relieve the Contractor from the responsibility of, or the necessity of, furnishing materials and workmanship conforming to the plans and specifications.

The Contractor shall deliver to the Engineer a certificate of compliance with the manufacturer for all materials purchased from the manufacturer.

Signal Turn-on

Prior to initial turn-on of the new signal, equipment, signal displays, and vehicle detection as shown on the plans and called for in these special provisions, shall be installed and operable. Applicable signs and pavement makings shall also be in place when the signals are put into operation.

Service Connection

Service connection shown on the plans is approximate only. The Contractor shall determine exact location from the servicing utility company, arrange to complete the service connection, and be responsible for all charges incidental thereto.

ITEM 815.1 (Continued)

The respective utility company is responsible for making the connection from the respective riser to the overhead wires.

Testing of Grounding System

The Contractor shall perform testing of the equipment grounding system in the presence of the Engineer in accordance with MassDOT Standard Specifications.

Flashing Operation

Changes from automatic flashing to stop-and-go operation and from stop-and-go to automatic flashing operation shall occur as set forth in the MUTCD.

Traffic Signal Equipment

The traffic signal controller unit (CU) malfunction management unit (MMU), cabinet power supply, bus interface units (BIU), and all other ancillary traffic signal control components included in the traffic control cabinet shall comply with the National Electrical Manufacturers Association (NEMA) Standard No. TS 2-2016(v03.07), Traffic Controller Assemblies with National Transportation Communications for ITS Protocol (NTCIP) Requirements.

Traffic Signal Controller

The traffic controller supplied shall conform to Section 3 "Controller Units" of the NEMA TS 2 Standard. The traffic controller shall be supplied in a TS 2 Type 1 Configuration as required in the list of major traffic signal items included on the plans for this location. Specifically, the controller unit (CU) shall be supplied as an actuated controller with NTCIP capabilities; defined as Type A1N in Subsection 3.2 of the NEMA TS 2 Standard.

The TS 2 Type 1 cabinet shall, at a minimum, meet the requirements of configuration 3 as defined in Table 5-2, "Type 1 Configurations" of the NEMA TS 2 Standard and according to the Item number listed above and on the traffic signal plans.

The controller unit shall utilize an interface conforming to Subsection 3.3 of the NEMA TS 2 Standard. The controller unit shall utilize an input/output interface conforming to the requirements of Paragraph 3.3.1 for all input/output functions with the Terminals and Facilities (TF), Malfunction Management Unit (MMU), detector rack assembly and auxiliary devices. The controller unit shall also meet the requirements of Paragraph 3.3.6 of the NEMA TS 2 Standard. The controller unit shall be supplied with Port 1, Port 2, and Port 3 as defined by the requirements of Subsections 3.3.1, 3.3.2, and 3.3.3, respectively.

The controller unit shall be keyboard-entry menu-driven unit with internal time base coordination (future use), emergency preemption, and programmatic capability.

ITEM 815.1 (Continued)

Malfunction Management Unit

The malfunction management unit (MMU) shall comply with Section 4 of the NEMA TS 2 standard. The MMU shall be capable of operating as either a Type 16 with 16 channels (8 vehicle, 4 pedestrian and 4 overlap) or a Type 12 with 12 channels (8 vehicle, 4 overlap). The MMU supplied shall be configured to operate as a Type 16 unit.

The MMU in either the Type 16 or Type 12 configuration shall be capable of operating in a NEMA TS 2 Type 1 cabinet, a NEMA TS 2 Type 2 cabinet, or a NEMA TS 1 cabinet without loss of functionality.

The MMU shall support the MUTCD's Flashing Yellow Arrow treatment.

Radar Vehicle Detectors

The Contractor shall provide and install Radar/Video Vehicle Detectors (RVVD) as shown on the plans and these special provisions. The RVVD system shall include all cameras, communication cables, interface boards, detection module, connections, software, mounting bracket with hardware, and accessories required by the manufacturer for proper operation of the system, including but not limited to surge protection devices. The RVVD shall monitor/detect the traffic flow continuously and shall generate vehicle presence events, and dilemma zone events. Via physical outputs, via a serial connection and/or via TCP/IP on an interface board in the traffic controller cabinet. The RVVD supplied shall be on the MassDOT Approved Traffic Signal Equipment List. The RVVD shall meet the following minimum requirements:

a. Camera	Integrated color CMOS and Doppler radar
b. Housing module:	Compact, esthetical, UV-resistant, and waterproof to IP67
c. Rain/Sun Shield	Aluminum
d. Camera Resolution:	5 megapixels minimum
e. Weight (excl. bracket):	approx. 4.5 lbs
f. Power Supply:	24 VDC
g. Power Consumption:	10 Watts maximum during regular operation
h. Radar:	Doppler, 24 GHz (K-band)
i. Measured Quantities:	Per lane and per vehicle (Presence, Speed, Count)
j. Maximum Mounting Height:	20 to 33' above roadway surface
k. Detection Range:	up to 600 feet
l. Viewing Angle:	50-degree minimum horizontally
m. Communications:	RS-232 and RS-485 Connection
n. Operating Temperature:	-40 degrees Celsius to 74 degrees Celsius
o. Environmental:	FCC Part 15 Class B
p. Humidity	0 to 95%, non-condensing
q. Shock & Vibration:	NEMA 2 specs

The RVVD shall have a red detection LED, clearly visible from the ground, that allows both

ITEM 815.1 (Continued)

the vehicle drivers and maintenance personnel to see the status of the detection module (i.e. detection, boot mode, safe status).

The RVVD shall allow digital zooming to obtain a VGA resolution (640x480 pixels) image. The detection system shall support streaming video in MJPEG, MPEG-4 and H.264 format.

The RVVD shall able to detect vehicles in 1 to 6 traffic lanes. It shall work on 1 of at least 3 available, user selectable subchannels. The radar shall be capable of tracking at least 32 independent objects at a sample time of 50 milliseconds, and at least 64 independent objects at a sample time of 100 milliseconds. It shall detect objects at speeds of 0 to 150 miles per hour with an accuracy of ±0.6 miles per hour.

The RVVD shall only track vehicles traveling in the appropriate direction of travel.

One computer mouse and one-color monitor within the controller cabinet for future viewing of the detection camera images shall be supplied by the Contractor. The Contractor shall also supply any necessary cables, interface devices and software for monitoring video detection via laptop computers.

Cabinet Interface - The interface board shall be used for system configuration, detection verification, detection output generation and error output generation. The interface board shall allow connection to up to 8 sensors and has an Ethernet connection to communicate with a PC, and a USS port. The interface board provides 4 contact closures (detection outputs). Also, an error output is present.

The interface board shall be capable of SDLC communications via an optional SDLC board. The interface board shall communicate to the optional SDLC board via a RS485 serial communication path. The optional SDLC board shall be capable of up to 64 detection outputs when connected to the SDLC port of the traffic controller.

Functionalities

- Vehicle presence detection at the stop bar - In one or more predefined virtual detection zones, the detection software shall detect both moving and stopped vehicles on multiple lanes, taking into account optical occlusion constraints. In total, it is possible to put 24 virtual detection zones in the image. Logical functions (AND, OR) shall be used to link multiple virtual detection zones to a single output. Detection shall be in any direction through the image and in more than 1 direction. Detection zone outputs shall be configurable to allow the selection of presence, entry pulse, exit pulse, extend, and delay outputs.

ITEM 815.1 (Continued)

- Vehicle presence detection at a distance from the stop bar (i.e. advance detection) - In up to 8 predefined radar zones, the detection software shall detect approaching and/or receding vehicles on multiple lanes, taking into account optical occlusion constraints. Per radar zone, it shall be possible to configure 8 detection zones using parameters per lane, phase, vehicle class (small or large) and/or in a preconfigured speed range (with minimum and maximum detection speed thresholds), at a user-configured distance from the stop bar, and with a user-configured zone length.

- Dilemma zone protection - Static dilemma zone protection will be possible using vehicle presence detection zones with a certain user- configured fixed length at a user-configured fixed distance from the stop bar.

- Dynamic dilemma zone protection will be realized by following user-configured thresholds:
  - Lane or Phase
  - Per Vehicle Class (small or large):
    - Allowed speed of approach (in mph or kph) Dilemma Zone In (in seconds)
    - Dilemma Zone Out (in seconds) o Minimum Speed (in seconds)
    - Maximum Speed (in seconds)

Per radar zone, it shall be possible to configure 1 static dilemma zone and 1 dynamic dilemma zone.

Software & Installation - The Contractor shall provide software that enables a technician to test all features and functions of the RVVD, and to perform all set-up procedures on a PC. The software shall be able to run on Windows XP, Windows Vista, Windows 7, Windows 8 and Windows 10. This software shall be delivered to the Town on a CD so that it can be installed on other laptops.

The RVVD shall be installed in accordance with the manufacturer's recommendations. Each RVVD shall be installed with surge protection device at the controller cabinet ends of the cable run. Surge protection devices shall be of the same manufacturer as the RVD.

The RVVD system shall be installed by factory certified installers and as recommended by the manufacturer and documented in installation materials provided by the manufacturer. Proof of the factory certification shall be provided. Installation includes connecting the RVVD to the traffic signal controller and power supply in the associated controller cabinet assembly. This setup shall include speed calibration using measured (not estimated) reference speeds. When the setup is complete and the RVVD is ready for operation, the values of all parameters that were set during the process shall be delivered to the Design Engineer in printed and computer-readable form. All equipment, such as radar gun, software, laptop computer with Windows 10, tools and cables, needed for setup work shall be provided by the Contractor.

ITEM 815.1 (Continued)

The Contractor shall be responsible for the proper programming of the RVVD, orientation of the RVVD, and all other work necessary to provide a complete and radar vehicle detection system. The Contractor may be required to field adjust the location of the RVVD in the presence of the Design Engineer to properly detect approaching vehicles at no additional cost.

Cables - Communication cables associated with the RVVD system shall be per the manufacturer's recommendations.

Warranty - The supplier shall provide a minimum two-year warranty on the RVVD system. During the warranty period, technical support shall be available from the supplier via telephone within 4 hours of the time a call is made by a user, and this support shall be available from factory-certified personnel or factory-certified installers.

Detector Rack Assembly

The detector rack assembly shall conform to Paragraph 5.3.4 of the NEMA TS 2 Standard. The detector rack assembly shall be supplied in a Type 2 configuration as defined in Table 5-9 of the NEMA TS 2 Standard.

Cabinet Power Supply

Separate power supply shall be supplied and installed in the TS 2 cabinet. As a minimum, the power supply shall meet all requirements of Paragraph 5.3.5 of the NEMA TS 2 Standard. The unit shall be AC line powered and provide regulated DC power, unregulated AC power, a line frequency reference for the load switches and other auxiliary cabinet equipment as required.

The power supply shall be either shelf of rack mounted.

The unit shall contain four LED indicators on the front panel to indicate the four outputs;

1. + 12 VDC +/- 1 VDC @ 2.0 amps,
2. + 24 VDC +/- 2 VDC @ 2.0 amps,
3. 12 VAC @ 250 milliamps, and
4. 60 Hz line frequency reference.

A test point terminal shall also be located on the unit front panel for + 24VDC and logic ground testing.

Surge Suppression

The Contractor shall supply and install surge suppression in the traffic controller cabinet in accordance with the manufacturer's recommendations. At a minimum surge suppression shall be provided video detection, power service, and emergency preemption.

ITEM 815.1 (Continued)

Load Switches

Load switches shall comply with Subsection 6.2 of the NEMA TS 2 standard. All load switches shall utilize optically isolated encapsulated modular solid state relays. Discrete components on circuit boards are not acceptable.

Load switch indicator lights shall be LED-type and wired on the input side of the device.

Flasher

Flashers shall comply with Subsection 6.3 of the NEMA TS 2 standard and be equipped with two output indicator lights which will show flashing power out to the cabinet assembly.

Flash Transfer Relays

Flash transfer relays shall comply with Subsection 6.4 of the NEMA TS 2 standard.

The field electrical loading for flash operation shall be wired through the transfer relays such that the load on the 2-circuit flasher is as balanced as possible within the limitations of the signal phasing.

Traffic Controller Cabinet

Controller cabinet shall conform to the NEMA TS 2 Standards, Section 7. Cabinet size shall be as indicated on the plans and as shown below.

TS 2 Type 1 Configuration Table

Item Number	NEMA TS 2 Cabinet Size	Nominal Cabinet Size (HxWxD)*	Config-uration Type Table 5-2	Load Switch Positions	Flash Transfer Relays	BIUs Required	Detector Rack Type Table 5-9	MMU (Channels)
815.1	6	52x44x24	3	12	6	3	2	16 Channel

* Approximate cabinet dimensions are provided in inches.

The cabinet shall be made of aluminum.

The cabinet shall contain a pull-out drawer, 19 in. wide with sufficient strength to hold a laptop computer. The top of the drawer shall be covered with a non-conductive, non-skid material and hinged such that a storage space is available to store cabinet documentation or small parts. The pull-out shelf shall be located to be useable as a place to operate a laptop computer without blocking the controller display. The back of the main door shall contain a resealable, heavy-duty opaque plastic envelope with two grommets that provide mounting to two integrated hooks. The

ITEM 815.1 (Continued)

heavy-duty plastic envelope will be used to store cabinet wiring diagrams and operations manuals that cannot be accommodated in the pull-out storage drawer.

Where applicable, the cabinet shall be installed with the door opening positioned in order to allow general observation of the flow of traffic and the inside of the cabinets at the same time.

Controller cabinet foundation shall not obstruct a sidewalk or crosswalk so that passage by physically-challenged persons is impaired.

GFI Duplex Outlet

A second separate GFI protected duplex outlet shall be supplied in the controller cabinet and mounted on the side wall of the cabinet for servicing other devices.

Bus Interface Units

The Bus Interface Units (BIU) shall comply with Section 8 of the NEMA TS 2 Standard. The BIU shall be fully interchangeable with any other manufacturer's unit and interchangeable in a NEMA TS 2 Type 2 cabinet assembly.

At a minimum the BIU shall perform the interface function between port 1 at the controller unit, the malfunction management unit (MMU), the detector rack assembly (video detection), and the terminal facilities. The cabinets shall be supplied with the appropriate number of BIUs required to provide an operating traffic control signal according to the plans and these specifications.

As a minimum, two LED indicators shall be provided on the BIU front panel. One indicator shall serve a dual use; as a power on indication and as a diagnostic indicator for proper operation of the device. The second indicator shall serve as a transmit indicator illuminating each time data is transmitted.

Spare Equipment

The Contractor shall provide the following spare signal equipment in the traffic signal controller cabinet:

- A full complement of load switches to accommodate each available position of the back panel.
- A full complement of flash transfer relays to accommodate each available position of the back panel.
- Two (2) Bus Interface Units.
- A 25 foot RS-232 cable for communication function with a laptop computer.

ITEM 815.1 (Continued)

Emergency Preemption

The emergency vehicle preemption system shall be installed in the same cabinet as the controller and shall conform to Town Standards.

The emergency vehicle preemption control system shall consist of a data-encoded phase selectors to be installed within the traffic control cabinets in the detector racks. These units will serve to validate, identify, classify, and record the signal from the optical detectors located on support structures at the intersection.

Upon receiving a valid signal from the detector, the phase selector shall generate a preempt call to the controller initiating a preemption operation as shown on the plans.

The optical detectors shall be single input, single output units used to control one approach. All traffic signal installations shall be supplied with a minimum of two optical detectors unless otherwise noted in the major items list.

The phase selectors shall be a rack-mounted plug-in two and/or four channel, dual priority device, as noted on the plans. The phase selectors shall plug into an empty slot in the detector rack. Programming the phase selectors shall be via a PC-based computer utilizing unit specific software. One copy of software on CDs shall be supplied and licensed to the Town. A hard copy of final programming data shall be left in the control cabinet. A complete set of interface cables for phase selectors to laptop connection shall be supplied in the cabinet.

The Contractor shall install confirmation strobes at the traffic signal location as shown on the plans. The confirmation strobe shall serve to validate to the driver of the emergency vehicle that the traffic signal has recognized the preemption call and will initiate the proper preemption sequence. The confirmation strobe shall be a white lens Whelen IS3 series or equivalent.

The Contractor shall be responsible for the proper programming of the phase selector, orientation of the optical detectors, and all other work necessary to provide a complete and operating emergency vehicle preemption systems. The Contractor may be required to field adjust the location of the optical detectors in the presence of the Engineer to properly detect preemption calls from approaching vehicles. Upon final inspection and testing, any discrepancies or failures to properly preempt the traffic signals will necessitate a complete replacement on any non-compatible equipment.

Mast Arms, Poles and Foundations

The mast arm poles shall be fabricated and constructed in conformance with the MassDOT December 2015 *Overhead Signal Structure & Foundation Standard Drawings* and as stated below.

All mast arm poles shall be Type 2 galvanized steel monolevers with shoe bases.

ITEM 815.1 (Continued)

Acceptance of Type 2 mast arm poles will be contingent upon review and approval of shop drawings submitted by the Contractor. Longhand design calculations shall be submitted by the Contractor with the shop drawings for all Type 2 mast arm poles.

The Contractor shall provide a set of calculations, stamped by a Structural Engineer registered in the Commonwealth of Massachusetts, along with plans and specifications for review by the Design Engineer.

All mast arm pole foundations shall be cored pier foundations and constructed in conformance with the December 2015 MassDOT *Overhead Signal Structure & Foundation Standard Drawings* and priced per Table 1 provided below.

TABLE 1

Mast Arm No.	Arm Length	Sta.	Offset	Soil Type	Found. Dia.	Found. Depth	Vert. Bars	Tie Bars
1	35’	15+21	55.0’ LT	Wet Sand (Loose)	3’- 6”	17’-0”	18-#8	#5@8”
2	35’	15+30	22+0’ RT	Wet Sand (Loose)	3’- 6”	17’-0”	18-#8	#5@8”
3	30’	16+15	21+0’ RT	Wet Sand (Loose)	3’- 6”	13’-6”	18-#8	#5@12”

If ledge or unsuitable soil is encountered (i.e. on which does not apply to the design tables shown in MassDOT’s standard drawings), an alternative design shall be provided by the Design Engineer. If utilities or other underground obstructions are encountered, the Contractor shall backfill the area to its original condition until an alternate design has been provided by the Design Engineer and approved by Town.

No separate payment will be made for work considered incidental to the excavation, including but not limited to, mast arm foundations, dewatering, etc. but all costs in connection therewith shall be included in the contract lump sum price.

Signal Housing Brackets

All signal housing brackets must be installed to manufacturer’s specifications and must be properly torqued.

ITEM 815.1 (Continued)

Signal Heads

Signal heads mounted on mast arms shall be rigidly attached to the mast arms. Signal heads attached on mast arms shall be mounted in such a way that the bottom of all signal heads are at the same height. All traffic signal lenses shall be 12 inches in diameter. All signal heads shall be equipped with ball and/or arrow light emitting diode (LED) modules. Five (5) inch non-louvered backplates and tunnel visors shall be provided on all signal heads.

All backplates shall include 3 inch wide, yellow reflective micro-prismatic retroreflective sheeting conforming to ASTM D4956 Type VIII of better on the outside edge of the backplates.

Signal housings shall be painted yellow.

Red, Yellow, And Green LED Vehicle Signal Module

All signal and pedestrian displays shall be equipped with LED signal modules. All red, amber, green, and pedestrian signal housings with the exception of optically programmed and fiber optic housings and shall conform to the following where applicable:

- ITE's Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Arrow Traffic Signal Supplement, Dated July 1, 2007
- ITE's Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement, Dated June 27, 2005.
- ITE's Pedestrian and Countdown Signal Modules Compliant to PTCSI - Part 2 Light Emitting Diode (LED), Dated, February 2011
- On the MassDOT Traffic Signal Approved Equipment List

For an LED module to installed on this project, the LED module shall have approval from the MassDOT Traffic Control Products Approved Equipment Committee and be included on the Traffic Control Products List prior to the date of this proposal.

To prevent the LED module warranty from being voided, the connecting leads on the module shall not be cut. The original LED module leads shall be connected to the signal head terminal block as continuous wire without splices.
The LED signal module will be replaced or repaired by the manufacturer if it exhibits one of the following:

- A failure due to workmanship or material defects within the first 60 months of field operation.
- A greater than 40 percent light output degradation or a fall below the minimum intensity levels (as defined by the latest ITE performance specifications) within the first 36 months of field operation

ITEM 815.1 (Continued)

Software

All local controller, malfunction management unit, and amplifier software shall be supplied with the latest available revision. Any software upgrades released by the manufacturer shall be supplied at no charge to the Owner for a period of five years after acceptance of the traffic signal installations.

Data Base Programming

Each programmable local hardware component (i.e., controller, malfunction management unit, preemption unit, and radar/video detectors) shall be initially programmed by the Contractor based on information contained on the plans. Three sets of hard copy programming per device shall be supplied by the Contractor.

Manuals and Keys

The Contractor shall supply two (2) copies of operating and maintenance manuals (i.e., controller, malfunction management unit, preemption unit) and two (2) sets of cabinet keys to the Town.

Ownership and Maintenance

Upon acceptance of the traffic signal system by the Town, the Contractor shall turn over all guarantees and warranties to the Town, where applicable. In turn, the Town shall assume ownership and maintenance of the signal system.

Basis of Payment

The work under Item 815.1 will be paid for at the Contract lump sum price, which price shall include all labor, material, equipment and incidental costs required to complete the work.

No separate payment will be made for work considered incidental to the excavation, including but not limited to, mast arm foundations, dewatering, etc., but all costs in connection therewith shall be included in the price bid for the Contract item.

Conduit will be paid for separately under Item 804.3, 3 Inch Electrical Conduit Type NM Plastic (UL).

ITEM 853.501 TEMPORARY IMPACT ATTENUATOR REMOVED AND RESET EACH

ITEM 853.52 TEMPORARY IMPACT ATTENUATOR UNI-DIRECTIONAL, NON-REDIRECTIVE (TL-2) EACH

DESCRIPTION

Work under Items 853.52 shall conform to the relevant provisions of Section 850 and shall consist of furnishing, installing, maintaining, and final removal of temporary impact attenuator systems for protection of the ends of temporary barrier and other roadside hazards in work zones. All work shall be in conformance with the specifications of the manufacturer and in close conformance with the locations, lines, and grades shown on the plans.

Work under Item 853.501 shall conform to the relevant provisions of Section 850 and shall consist of maintaining, removing, relocating, and reinstalling temporary impact attenuators where indicated on the plans or as directed by the Engineer.

MATERIALS

The Contractor shall supply a temporary impact attenuator that meets the same or higher crash Test Level (TL) as the adjacent temporary barrier, unless otherwise shown on the plans. The temporary attenuator shall be listed on the Department's Qualified Traffic Control Equipment (QTCE) List.

The temporary impact attenuator shall be designed to fit within reasonably close tolerance of the dimensions given on the plans.

The Contractor shall supply shop drawings for the temporary attenuator and for any anchorage system and for any transitions or connections between the temporary attenuator and the adjacent barrier or other roadside hazard.

The side of the temporary attenuator that faces traffic shall include a Type 3 Object Marker that conforms to the language found in Sections 2C.64 and 2C.65 of the *Manual on Uniform Traffic Control Devices.*

Unless a separate barrier system protects it from opposing traffic, only temporary impact attenuators that are certified for bi-directional use shall be used in medians.

CONSTRUCTION METHODS

Installation means and methods shall be per the manufacturer's specifications and/or drawings. Excavation for temporary attenuator foundations and anchorage shall be made to the required depth and to a width that will permit the installation and bracing of forms where necessary. All soft and unsuitable material shall be replaced with compacted gravel borrow.

The Contractor shall supply the Engineer instructions for installation and the manufacturer's recommended routine inspection and maintenance program. The cost of inspection and maintenance of temporary attenuators shall be considered incidental in nature.

ITEM 853.501 & 853.52 (Continued)

Damaged temporary impact attenuators shall be replaced by the Contractor within 24 hours or as directed by the Engineer, at the Contractor's expense. A truck mounted attenuator that meets the same or higher TL, or other means of protecting the damaged temporary impact attenuator, shall be deployed until the repairs or replacement has been completed, at the Contractor's expense.

Temporary Impact Attenuators Removed and Reset consists of removing temporary impact attenuators, relocating, and reinstalling at a new location per the specifications and recommendations of the manufacturer and as shown on the plans or as directed by the Engineer.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Method of measurement and basis of payment shall be per Section 850.80 and 850.81, respectively.

ITEM 854.014 TEMPORARY PAVING MARKINGS - 4 INCH (PAINTED) FOOT

ITEM 854.034 TEMPORARY PAVING MARKINGS - 4 INCH (TAPE) FOOT

The work under these items shall conform to the relevant provisions of Section 850 of the Standard Specifications and the following:

The Contractor shall furnish and install 4-inch temporary white and yellow painted or tape lines within Town right-of-way on Montello Street and Main Street unless otherwise noted on the plans or as directed by the Engineer.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Method of measurement and basis of payment shall be per Section 850.80 and 850.81, respectively.

ITEM 853.8 TEMPORARY ILLUMINATION FOR WORK ZONE DAY

The work under this Item shall conform to the relevant provisions of Section 850 of the Standard Specification and the following:

The work under this Item shall include the deployment and maintaining in proper operating condition a LED balloon diffuser lighting system. These portable light towers shall be used throughout the project area for temporary work zone lighting. The use of unshielded high wattage flood lights shall not be permitted.

These towers shall be used, relocated and adjusted to meet the criteria in Section 850 of the Standard Specifications and the following:

The Contractor shall illuminate the following work zone areas:

- Change in direction (i.e., work zone entrances and exits, crossovers, etc.)
- Tapered areas
- Actual area where the construction is being performed

Light measurement shall be based on the illuminance method and the lighting levels shall be based on the classification of construction activity that is taking place. At no time shall the light level be below 5 fc and the uniformity shall not exceed 6:1. Task Classifications and recommended illumination levels is shown in Table 1.

TABLE 1 TASK CLASSIFICATIONS AND ILLUMINATION LEVELS

Task Classifications	Illumination Level	Average Minimum Maintained Illuminance
All work operations areas, setup of lane or road closures, lane closure tapers, and flagging stations, such as: Excavation (all types), Embankment Fill and Compaction, Reworking Shoulders, Asphalt Pavement Rolling, Subgrade, Stabilization and Construction, Base Course Rolling, Sweeping, Cleaning and Landscaping.	Level I	5 foot-candles
Areas on or around construction equipment; asphalt paving, milling, and concrete placement and/or removal, such as, Milling, Removal of Pavement, Asphalt Paving and Resurfacing, Concrete Pavement, Waterproofing and Sealing, Sidewalk Construction, Base Course Grading and Shaping, Surface Treatment, Bridge Decks, Drainage Structures and Drainage Piping, Other Concrete Structures, Barrier Wall and Traffic Separators, Guardrails and Fencing, Striping and Pavement Markings, Repair of Concrete Pavement, Highway Signs, Hole Filling and Repair of Guardrails and Fencing.	Level II	10 foot-candles

Pavement or structural crack/ pothole filling; joint repair, pavement patching and/or repairs, installation of signal/electrical/mechanical equipment, such as, Traffic Signals, Highway Lighting Systems and Crack Filling	Level III	20 foot-candles

A detailed work zone lighting plan shall be submitted to MassDOT for approval before any work has commenced. Said plan shall include photometrics that detail the light levels that are to be provided. Photometrics shall include the following: calculated illuminance, uniformity, and glare avoidance verification throughout the work zone as well as the active travel lanes. The lighting plan shall be submitted with all supporting calculations, catalog cut sheets and supporting documentation.

Any potential glare from the lighting system should be considered from each direction and on all approaching roadways and opposing lanes of traffic. Glare from the illumination system should be minimized as much as possible for both workers and motorists in adjacent active travel lanes. If necessary, the Contractor shall provide supplemental hardware, such as, visors, louvers, shields, glare screen and barrier to reduce glare in adjacent active travel lanes.

The plan shall show the layout for each work area including the number, location, spacing of all fixed and/or mobile structures, description of illumination equipment that is proposed to be used on this project, and mounting details for mobile lights attached to construction equipment. Plan shall be designed by a professional engineer that is registered and licensed by the Commonwealth of Massachusetts and shall be submitted to the Engineer for approval prior to any nighttime work operations within the State Highway Right of Way.

The Contractor shall allow MassDOT up to 30 calendar days for review and comment.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 853.8 will be measured and paid for at the contract unit price per DAY. The cost shall include all labor, materials, equipment, tools and all incidentals required for the design and installation of the work zone lighting system. This shall include, but not be limited to lighting plan preparation, wiring connections, equipment relocations, and include all material and labor incidental for a complete, functional and operational work zone illumination system.

The price of this item shall include the material and labor necessary to install any supplemental hardware required to reduce glare on all adjacent active travel lanes.

The per day price shall be full compensation for all “Temporary Illumination for Work Zone” regardless of the number of concurrent work areas, amount of equipment concurrently in use or the durations of or changes of the work shifts per day.

Installation and modifying the existing set-up shall be incidental to Item 853.8.

ITEM 859.1 REFLECTORIZED DRUMS WITH SEQUENTIAL DAY FLASHING WARNING LIGHTS

The work under this Item shall conform the relevant provisions of Section 850 of the Standard Specifications and the following:

Work under this item consists of furnishing, installing, maintaining in proper operating conditions, and removing reflectorized drums, and any necessary ballast, equipped with sequential flashing warning lights.

MATERIALS

Reflectorized drums shall be listed on the MassDOT Qualified Traffic Control Equipment List.

Reflective sheeting on drums shall meet or exceed ASTM D4956 Type VIII. All drums shall be maintained in a satisfactory manner including the removal of oils, dirt, and debris that may cause reduced retroreflectivity.

The Contractor shall use one of the following sequential flashing warning light systems unless otherwise approved by the Engineer:

1. Empco-Lite LWCSD.
2. pi-Lit® Sequential Barricade-Style Lamp; or
3. Unipart Dorman SynchroGUIDE.

Sequential flashing warning lights shall be secured to reflectorized drums per the light manufacturer's specifications.

CONSTRUCTION METHODS

The first ten (10) drums in any merging or shifting taper as designated in the Temporary Traffic Control Plan shall be equipped with sequential flashing warning lights. These lights shall be operating, at a minimum, between dusk and dawn when the taper is deployed.

The successive flashing of the sequential warning lights shall occur from the upstream end of the merging or shifting taper to the downstream end of the taper in order to identify the desired vehicle path. Each warning light in the sequence shall be flashed at a rate of not less than 55, nor more than 75 times per minute.

Warning lights shall be powered off when drums are not deployed in a taper.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Method of measurement and basis of payment shall be per Section 850.80 and 850.81, respectively.

ITEM 866.104 4 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) FOOT

ITEM 867.104 4 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) FOOT

Work under these items shall conform to the relevant provisions of Section 860 of the Standard Specifications and the following:

All permanent pavement markings supplied under these items shall conform to the applicable MassDOT's standards for 6 Inch Reflectorized White Line (Thermoplastic) and 6 Inch Reflectorized Yellow Line (Thermoplastic).

The work under these items shall consist of providing, installing, maintaining the 4-inch wide reflectorized white and yellow pavement marking lines, as shown on the plans or as directed by the Engineer.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 866.104 and 867.104 will be measured and paid for at the Contract unit prices per foot, which prices shall include all labor, material, equipment and incidental costs required to complete the work.

ITEM 874.4 TRAFFIC SIGN REMOVED AND STACKED EACH

The work under this item shall conform to the relevant provisions of Section 828 of the Standard Specifications and the following:

The work shall include the careful removal, transporting and stacking of traffic signs, attached hardware and supports from locations shown on the plans and as required by the Engineer, is salvageable.

Work shall also include excavation of existing foundations to a depth of at least 6 inches below grade, the supplying and placing of compacted gravel, and the restoration to original condition of any natural features disturbed in any way or manner by the operation.

The Contractor shall accept and hold entirely responsibility for the removal, handling and stacking at a location determined by the owner. Any signs and posts damaged or lost either directly or indirectly as a result of the Contractor's operations shall be replaced by the Contractor at no additional cost to the Owner.

The Contractor shall coordinate the removal of signs and posts with the Town and Engineer prior to and at the completion of the above work. The Contractor shall coordinate with the Town to schedule drop-off time. The existing signs shall be stacked at the Carver Department of Public Works, 51 Pond Street, Carver. Existing signs shall remain in place until proposed new signs are in place.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 874.4 shall be measured at the Contract unit price per Each traffic sign unit removed and stacked.

Item 874.4 shall be paid for at the Contract unit price per Each, which price shall include all labor, materials, equipment, transportation, gravel backfill, area restoration, and all incidental costs required to complete the work.

ITEM 991.01 CONTROL OF WATER LUMP SUM

The work under this Item shall conform to the relevant provisions of Section 140 of the Standard Specifications and the following:

The work shall include the furnishing, installation, operation, maintenance, and removal of the water control systems required for the construction of the proposed culvert and water line installation at Montello Street. The Water Control Systems shall be capable of both containing flow through the work area and lowering the water table to an elevation below the bottom of the foundation, as determined by the Engineer and as shown on the Plans.

The Systems shall divert the water flow through the construction area. Any stream diversion should at a minimum be sized to allow flow rates equal to that of the existing flow to ensure against a backup of water on the upstream side. Sandbags or other means, as approved by the Engineer, shall be used both upstream and downstream to contain the flows within the culvert and stream.

The Contractor shall install and maintain temporary measures for the containment of the stream flow, the collection of siltation and debris due to the construction activities and the maintenance of drainage through the drainage system upstream and downstream during the construction period. Temporary control measures shall include, but are not limited to, the use of sandbags, stone dikes and dams, sediment basins, crushed stone, paved or unpaved waterways and other devices or methods which meet the requirements of this section and the approval of the Engineer.

The use of earthen berms in the stream is prohibited.

The Contractor shall confirm the flow rate of the stream and the surface elevation in the field prior to commencing activities. The Contractor shall adjust the control of water to accommodate field measure conditions.

The Contractor shall submit a water control plan defining and detailing the methods for control of water and type of installation to be used to the Engineer for approval prior to construction. All plans, procedures and calculations shall be stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. The submitted construction plan must include a Contingency Plan to describe operations protocols in the event of a flow event that exceeds the diversion/bypass design flow rate.

The Contractor shall be responsible for the removal and legal disposal of all temporary structures or devices to an off-site location. The Contractor is responsible for regrading of all disturbed areas, and any other incidental work required to perform this work as directed by the Engineer.

Method of Measurement and Basis of Payment

Payment for the work to be done under these items shall be at the contract lump sum bid price for Item 991.01 Control of Water, which shall include all labor, materials, equipment, sandbag dam or other means of support of excavation, utility adjustments, temporary diversion pipes,

ITEM 991.01 (Continued)

excavation for temporary pipes, filter bags, pumping removal of temporary water control devices and all incidental costs required to complete the work.

Gravel borrow and crushed stone will be paid for separately under Items 151. And 156., respectively.

ITEM 995.01 PRECAST CONCRETE ARCH CULVERT LUMP SUM

The work to be done under this item shall conform to the relevant provisions of Section 995 of the Standard Specifications and the following:

The work under this item includes all labor and materials required to design, furnish and install the precast concrete culvert, precast concrete pedestal walls and footings, precast concrete headwalls, precast concrete wingwalls, precast concrete wingwall footings, wingwall foundation preparation, grout, connecting hardware, membrane waterproofing, damp-proofing, waterstops, filter fabric, preformed joint fillers and sealants, crushed stone for weepholes, and any and all necessary ancillary items.

The lump sum payment for the work listed above does not include payment for excavation, gravel borrow for backfilling structures and pipes and other work, as listed elsewhere in the Contract Documents.

5,000 - 3/4 - 705 Cement Concrete

The work to be done under this heading shall conform to the relevant provisions of Section 901 and the following:

This Item shall include furnishing and installing of culvert footing, headwalls, pedestal walls and wingwalls to complete the construction according to the designs and dimensions indicated on the Plans or as directed and to close conformity with the lines and grades established by the Engineer.

PVC sleeves, shims, joint fillers, joint sealers, waterstops, backer rods, neoprene seals, bituminous damp-proofing, cement concrete blocks and mortar for waterproofing, weep hole components, crushed stone behind weep holes, leveling bolts, lifting hardware, controlled and other components not covered separately in these project specifications shall be considered incidental to this concrete heading.

Steel reinforcement, mechanical bar connectors, threaded inserts, and grouted couplers shall be considered incidental to this concrete heading. All mechanical reinforcing bar splicers, threaded inserts, and grouted couplers shall be epoxy coated and shall conform to the requirements of Section 901 and subsection M8.01.9 of the Standard Specifications and shall be on the MassDOT Qualified Construction Materials List.

Steel Reinforcement for Structures (Epoxy Coated)

The work to be done under this heading shall conform to the relevant provisions of Section 910 and the following:

All reinforcing bars shall be epoxy coated in accordance with AASHTO M284.

Epoxy coated support devices shall be used when installing reinforcing steel. Specified clearances, cover requirements, and all other reinforcing steel geometry requirements shall be maintained.

ITEM 995.01 (Continued)

The Contractor shall submit shop drawings to the Engineer for approval including, but not limited to, layout plans, bend diagrams, and typical sections. No materials shall be fabricated or shipped prior to approval of the shop drawings by the Engineer.

Geotextile Fabric for Separation

The work to be done under this heading shall consist of wrapping a geotextile fabric around all culvert joints, as shown on the plans and as directed by the Engineer.

Geotextile fabric shall be in conformance with M9.50.0 of the Standard Specifications.

Membrane Waterproofing

The work under this item shall conform to the relevant provisions of Section 965 of the Standard Specifications.

Damp-Proofing

The work under this heading shall conform to the relevant provisions of Section 970 of the Standard Specifications. Bituminous damp-proofing shall be installed to the limits shown on the plans and as directed by the Engineer.

Precast Concrete Arch Culvert

The work under this heading shall conform to the relevant provisions of Section 901 of the Standard Specifications and the following:

The work under this heading shall include design, fabrication, and installation of the precast arch culvert and concrete pedestals as shown on the plans. Also included is the furnishing and installing of all steel reinforcement, neoprene gaskets, sealants, miscellaneous steel, hardware, and all other items incidental to the work.

A. Design

The precast arch culvert shall be designed by the Contractor, submitted to the Engineer for review and approval, and shall be in accordance with the following criteria:

- 2020 MassDOT LRFD Bridge Manual and AASHTO LRFD Bridge Design Specifications, 9th Edition. The culvert shall be designed to accommodate AASHTO HL-93 live loading.

ITEM 995.01 (Continued)

- The Contractor shall provide structural calculations based on loads and dimensions as shown on the drawings and given within this Special Provision. Precast manufacturer shall review the Geotechnical and Hydrogeological Engineering Letter, as prepared by Sanborn, Head & Associates, Inc. and soil boring logs for design parameters and considerations. Calculations shall be stamped and signed by a Professional Structural Engineer, registered in the Commonwealth of Massachusetts.

- The concrete shall have a minimum compressive strength of 5,000 psi.

- All steel reinforcing shall be epoxy coated and shall conform to the requirements of AASHTO M31 Grade 60 and shall have minimum covers in accordance with AASHTO and MassDOT standards.

- All grout shall be high strength non-shrink grout with a minimum 28-day compressive strength of 5000 psi. Grout for setting walls and culvert shall be a flowable material. All grout products shall be materials on the MassDOT Qualified Construction Materials List. The grout shall be the same color as the precast concrete. Grout shall be considered incidental to this concrete heading.

- Each culvert section shall be monolithically cast as an arch section with open ends. Special end sections shall be cast as needed to conform to the details and dimensions shown on the plans.

- Culvert internal dimensions as shown on the Plans shall be maintained. The arch shall be adequately sized in accordance with AASHTO material specifications M259 and M273 for loading data and soil data specified herein. Roof and sidewalls shall be adequately sized in accordance with ASTM C1577-08 for loading data given here within and soil data presented in the boring logs.

- All bends shall be mitered and designed by the manufacturer.

- Concrete pedestals shall conform to the relevant provisions of Sections 201 and 901 of the Standard Specifications.

- Each culvert section shall have a male and female shiplap joint with not less than 1-1/2 inch concrete overlaps with a factory installed neoprene gasket fastened to the shiplap joint surface. Each section shall also be provided with holes or inserts for lifting hardware and with recessed inserts for attachments of assembly pulling irons.

- The quality of materials, the process of manufacture, and the finished arch sections shall be subject to inspection by the Engineer and purchaser.

- Precast concrete wingwalls shall be gravity type walls, at the discretion of the Contractor. Wingwalls shall be designed by the Contractor and submitted to the Engineer for review and approval.

B. Submittals

The manufacturer shall submit shop drawings to the Engineer for approval including, but not limited to, layout plans, steel reinforcing details, typical culvert sections, and structural calculations. Shop drawings shall include all material and detail information and shall be stamped and signed by a Professional Structural Engineer, registered in the Commonwealth of Massachusetts.

Fabrication of any and all culvert components shall not commence prior to the approval of the calculations and shop drawings by the Engineer.

C. Shop Drawings

Shop Drawings shall be prepared for all precast elements and shall include the following:

- Prepare shop drawings and stamp by a Professional Engineer licensed in Massachusetts.
- Show all lifting inserts, hardware, or devices and locations on the shop drawings for Engineer's approval. All lifting devices shall be designed by the Contractor.
- Show locations and details of the lifting devices, including supporting calculations, type, and amount of any additional reinforcing required for lifting. Design all lifting devices based on the no cracking criteria in Chapter 8 of the PCI Design Handbook (seventh edition).
- Show minimum compressive strength attained prior to handling the precast elements.
- Do not order materials or begin work until receiving final approval of the shop detail drawings.

D. Assembly Plan

The Assembly Plan is a document prepared and submitted by the Contractor prior to the start of work that details the means to which the Contractor will construct the precast concrete elements, clearly identifying all stages of the construction. It includes all materials and equipment to construct the precast elements and elements attached or embedded thereto. The Assembly Plan shall be prepared by and stamped by a Professional Engineer, registered in the State of Massachusetts, with working knowledge of the Contractor's equipment, approved shop drawings, and materials to build the project.

The Assembly Plan submittal requires the Contractor to detail the sequence of construction and is treated as a Construction Procedure that will be reviewed by the District Construction Office. The approval of this document will serve as a guideline to allow relaxation of the certain provisions of the Standard Specifications (for example, interim concrete strengths and curing procedures).

The following list details the minimum criteria that should be included in the Assembly Plan:

- A detailed sequence of operations that the Contractor will follow. The sequence shall include a timeline for installation of all major elements, including the installation of temporary works and cure times of selected grouts and controlled density adjacent to foundation elements.
- The Contractor is responsible for determining the center of gravity for all elements. Special care shall be used for unusual elements that are not symmetric, These elements may require special lifting hardware to allow for installation in a plumb or flat position.
- Include a work area plan, depicting items such as temporary earth support, drainage structures, etc. The Contractor is required to coordinate the various subcontractors that will need to occupy the same area and ensure that there are no conflicts.
- Include details of all equipment that will be employed for the construction of the precast elements.
- Include details of all equipment to be used to lift elements including cranes, excavators, lifting slings, sling hooks, and jacks. Include crane locations, operation radii, and lifting calculations. It is anticipated that the Contractor will use the Fabricator's lifting inserts, but this needs to be coordinated prior to approval of the precast shop drawings. Follow Chapter 8 of the PCI Design Handbook (seventh edition) for handling and erection bracing requirements. The lifting of all elements shall be in conformance with MassDOT Specifications 960.61.
- Include methods of providing temporary bracing and shoring of the elements. Include methods of adjusting and securing the element after placement.
- Submit plan sheets depicting the assembly procedures for the precast elements.

E. Quality Control and Assurance

In order to ensure a consistent level of quality, the following criteria shal lbe incorporated into the project:

- All precast elements shall be fabricated by a MassDOT certified precast concrete facility. Site cast precasting will not be permitted.

The Contractor is required to provide field survey to determine that the cast-in-place elements are placed within the tolerances recomeded by the precast manufacturer.

ITEM 995.01 (Continued)

- The Contractor is solely responsible for testing of grouts to allow the Contractor to proceed with various stages of construction. For example, if the approved Assembly Plan allows the construction to proceed after a grout has achieved a compressive strength of 100 psi, the Contractor will be required to test the grout proving that the strength has been achieved with the specified factor of safety. For materials used throughout the construction that have a proven strength gain at predetermined time interval, the compressive testing requierements may be waived by the Engineer. The Contractor shall be solely responsible for any required interim strength testing. All testing furnished by the Contractor shall be performed by an MassDOT approved laboratory. All testing results shall be submitted to the Engineer for approval.
- The Fabricator shall permanently mark each precast element with date of casting and supplier identification. Stamp markings in fresh concrete.
- The Fabricator shall dry fit elements prior to shipment to ensure that the elements can be properly joined in the field.
- The Fabricator and Contractor shall prevent cracking or damage of precast elements during handling, storage, transportation, and final installation in permanent position.
- If damage occurs repair defects of precast elements:

1. Members that sustain damage or surface defects during fabrication, handling, storage, hauling, or erection are subject to review or rejection.
2. Prepare an NCR detailing the damage and the outlining the repair procedure.
3. Obtain approval from the Engineer before performing repairs.
4. Repair work must re-establish the elements' structural integrity, durability, and aesthetics to the satisfaction of the Engineer.
5. Determine the cause when damage occurs and take corrective action.
6. Failure to take corrective action, leading to similar repetitive damage, can be cause for rejection of the damaged element.
7. Cracks that extend to the nearest reinforcement plane and fine surface cracks that do not extend to the nearest reinforcement plane but are numerous or extensive are subject to review and rejection.
8. Full depth cracking and breakage greater than one foot are cause for rejection.

- Construct precast elements to tolerances shown on the plans. Where tolerances are not shown, follow tolerance limits in the PCI MNL116-99, "Manual for Quality Control for Plants and Production of Structural Precast Concrete Products, 4th Edition". Elements that are found to be out of tolerance may be subject to rejection. Rejection of the elements may be waived by the Engineer if the Contractor can demonstrate that the out of tolerance element can be installed without significant modifications to the bridge. For example, an over width element may be acceptable if the adjacent element is under width.

ITEM 995.01 (Continued)

- The plant will document all test results. The quality control file will contain at least the following information:
    1. Element identification
    2. Date and time of casting
    3. Concrete cylinder test results
    4. Quantity of used concrete and the batch printout
    5. Form-stripping date and repairs if applicable
    6. Location/number of blockouts and lifting inserts
    7. Temperature and moisture of curing period

  Document lifting device details, requirements, and inserts

F. Installation of Precast Concrete Elements

The field personnel shall have knowledge of and follow the approved Assembly Plan. If changes are warranted due to varying site conditions, resubmit the plan for review and approval. Establish working points, working lines, and benchmark elevations prior to placement of all elements. The Contractor is responsible for field survey as necessary to complete the work.

Check the condition of the receiving bonding surface prior to connecting elements and take any necessary measures to remove items such as dust, rust, and debris to provide the satisfactory bonding required between the the existing concrete surfaces and the precast concrete elements.

Saturate surface dry (SSD) all surfaces receiving non-shrink grout. Mix and place the grout following manufacturer's recommendations for preparation and installation.

Place elements in the sequence and according to the methods outlined in the Assembly Plan. Adjust the height of each element to within acceptable tolerances by means of leveling devices or plastic shims. Ensure that the precast element is in the proper horizontal and vertical location prior to releasing from the crane and setting the next unit.

Where applicable, do not remove the temporary bracing or proceed with the construction supported by the precast element until the compressive test result of the cylinders for the cementitious material has reached the specified minimum values as stated in the approved Assembly Plan.

Method of Measurement and Basis of Payment

Within ten (10) days after the award of the contract, the Contractor shall submit in duplicate, for approval by the Engineer, a schedule of the quantities and unit prices of the structure components listed below. The cost and labor for any item not listed but required to complete the work shall be considered incidental to Item 995.01. If required, wingwall subgrade material as recommended by the manufacturer will be paid for under Item 156. Crushed Stone.

ITEM 995.01 (Continued)

Culvert Structure

	Quantity	Unit	Price Per Unit	Amount
901. 5,000 PSI-3/4 IN-705 Cement Concrete		CY		
910.1 Steel Reinforcement for Structures (Epoxy Coated)		CY		
965. Membrane Waterproofing		SY		
970. Damp-proofing		SY		
995.01 Precast Concrete Arch Culvert	1	EA		

Total =

ITEM 999. CONSTRUCTION STAKING LUMP SUM

Under this item, the Contractor shall layout and set all lines, grades, and measurements necessary for construction of the work. The Engineer shall provide information on the baseline system and elevation control available.

All staking shall be directed and performed by qualified engineering or surveying personnel who are trained, experienced and skilled in construction layout of the type required under this Contract. The Contractor shall submit the qualifications of the survey personnel to the Owner for review and approval. The Owner reserves the right to reject any personnel which, in the Owner's judgment, are not adequately qualified. The Owner also reserves the right to evaluate the performance of the survey personnel during the course of the work and to require the replacement of any personnel whose work, in the judgment of the Owner, is unsatisfactory.

The Engineer may check the layout as established by the Contractor at any time as the work progresses. The Contractor shall be informed of the results of these checks, but the Engineer by doing so in no way relieves the Contractor of his responsibility for the accuracy of the layout work. The Contractor shall correct or replace any deficient layout and construction work which may be the result of inaccuracies in the Contractor's layout at no additional cost to the Owner.

ITEM 999.1 **POLICE SERVICES** **ALLOWANCE**

The Contractor shall furnish police services required to direct traffic on existing roadways where traffic is maintained.

The Contractor shall provide such police officers as may be deemed necessary by either the Engineer or the Town for the direction and control of all traffic traveling within and through the project area. The police officers shall be obtained from the Town Police Department when possible. The police officers shall be paid by the Contractor at the prevailing rate of wages established by the Town and/or State. Uniformed traffic police shall be on an hourly bases using the Police Department invoices and hourly rates. No mark-up or administrative fees will be charged. The Police Department invoices shall include the officer's name, date, location, hours worked, and wage rate.

ALLOWANCE FOR POLICE SERVICES

An allowance of **$56,000.00** for the furnishing of police services has been included in all bids. This allowance is determined by multiplying the number of hours estimated as necessary by the prevailing hourly rate of wages established for such services. The Contractor shall submit certified copies of itemized bills of services rendered for review and approval by the Engineer. The allowance will be adjusted to the actual amount paid for authorized and approved police services as stipulated and shall include other payments due to any legal requirements of the State and Federal governments.

ITEM 999.2 **AS-BUILT PLANS** **LUMP SUM**

The Contractor shall furnish electronic CAD files and Mylar "AS BUILT" plans of the completed project to the City and MassDOT. These "AS BUILT" plans shall be furnished prior to the date of final Acceptance.

The Engineer will make PDFs of the original drawings available to the Contractor for use in preparing the as-built drawings. However, the Contractor may request a CAD version of the contract drawings as an alternative method for preparing the “AS BUILT” plans. In either case, final “AS BUILT” plans shall contain all information shown on the contract drawings and shall clearly indicate changes that were made during construction.

The “AS BUILT” plans shall be titled “AS BUILT” and stamped and dated by a Professional Engineer registered in the Commonwealth of Massachusetts. The Professional Engineer’s stamp is required to certify any changes made to the contract drawings and shall not dictate responsibility for the original design drawings.

The “AS BUILT” plans shall provide a record of constructed improvements for future reference; therefore, partial plan sets will not be accepted. The Contractor may elect to use a combination of reproducible duplicates of the design drawings and revised CAD drawings to provide a complete set of “AS BUILT” plans.

Prevailing Wage Rates

CHARLES D. BAKER
Governor

KARYN E. POLITO
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

As determined by the Director under the provisions of the Massachusetts General Laws, Chapter 149, Sections 26 to 27H

ROSALIN ACOSTA
Secretary
MICHAEL FLANAGAN
Director

Awarding Authority: Town of Carver

Contract Number:

City/Town: CARVER

Description of Work: New roadway construction, culvert replacement, water line installation, traffic signal installation.

Job Location: Montello Street, Carver, MA

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule from the Department of Labor Standards ("DLS") if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- All apprentices working on the project are required to be registered with the Massachusetts Department of Labor Standards, Division of Apprentice Standards (DLS/DAS). Apprentice must keep his/her apprentice identification card on his/her person during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DLS/DAS regardless of whether or not they are registered with any other federal, state, local, or private agency must be paid the journeyworker's rate for the trade.**
- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule. Awarding authorities are required to request these updates no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F "rental of equipment" contracts.
- Every contractor or subcontractor which performs construction work on the project is required to submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. A sample of a payroll reporting form may be obtained at http://www.mass.gov/dols/pw.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.
- Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$35.95	$12.91	$14.82	$0.00	$63.68
	08/01/2021	$35.95	$13.41	$14.82	$0.00	$64.18
	12/01/2021	$35.95	$13.41	$16.01	$0.00	$65.37
(3 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$36.02	$12.91	$14.82	$0.00	$63.75
	08/01/2021	$36.02	$13.41	$14.82	$0.00	$64.25
	12/01/2021	$36.02	$13.41	$16.01	$0.00	$65.44
(4 & 5 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$36.14	$12.91	$14.82	$0.00	$63.87
	08/01/2021	$36.14	$13.41	$14.82	$0.00	$64.37
	12/01/2021	$36.14	$13.41	$16.01	$0.00	$65.56
ADS/SUBMERSIBLE PILOT *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$103.05	$9.40	$23.12	$0.00	$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR *LABORERS - ZONE 2*	06/01/2021	$35.75	$8.60	$16.64	$0.00	$60.99
	12/01/2021	$36.66	$8.60	$16.64	$0.00	$61.90
	06/01/2022	$37.56	$8.60	$16.64	$0.00	$62.80
	12/01/2022	$38.41	$8.60	$16.64	$0.00	$63.65
	06/01/2023	$39.31	$8.60	$16.64	$0.00	$64.55
	12/01/2023	$40.21	$8.60	$16.64	$0.00	$65.45
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.75	$8.60	$16.64	$0.00	$60.99
	12/01/2021	$36.66	$8.60	$16.64	$0.00	$61.90
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. *HEAT & FROST INSULATORS LOCAL 6 (BOSTON)*	12/01/2020	$38.10	$12.80	$9.45	$0.00	$60.35
ASPHALT RAKER *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.73	$13.75	$15.80	$0.00	$80.28
	12/01/2021	$51.88	$13.75	$15.80	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.73	$13.75	$15.80	$0.00	$80.28
	12/01/2021	$51.88	$13.75	$15.80	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 2*	06/01/2021	$35.75	$8.60	$16.64	$0.00	$60.99
	12/01/2021	$36.66	$8.60	$16.64	$0.00	$61.90
	06/01/2022	$37.56	$8.60	$16.64	$0.00	$62.80
	12/01/2022	$38.41	$8.60	$16.64	$0.00	$63.65
	06/01/2023	$39.31	$8.60	$16.64	$0.00	$64.55
	12/01/2023	$40.21	$8.60	$16.64	$0.00	$65.45
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.75	$8.60	$16.64	$0.00	$60.99
	12/01/2021	$36.66	$8.60	$16.64	$0.00	$61.90
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER *BOILERMAKERS LOCAL 29*	01/01/2020	$46.10	$7.07	$17.98	$0.00	$71.15

Apprentice - *BOILERMAKER - Local 29*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	$29.97	$7.07	$11.69	$0.00	$48.73
2	65	$29.97	$7.07	$11.69	$0.00	$48.73
3	70	$32.27	$7.07	$12.59	$0.00	$51.93
4	75	$34.58	$7.07	$13.49	$0.00	$55.14
5	80	$36.88	$7.07	$14.38	$0.00	$58.33
6	85	$39.19	$7.07	$15.29	$0.00	$61.55
7	90	$41.49	$7.07	$16.18	$0.00	$64.74
8	95	$43.80	$7.07	$17.09	$0.00	$67.96

Notes:

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) *BRICKLAYERS LOCAL 3 (QUINCY)*	02/01/2021	$55.75	$11.39	$22.09	$0.00	$89.23
	08/01/2021	$57.15	$11.39	$22.25	$0.00	$90.79
	02/01/2022	$57.74	$11.39	$22.25	$0.00	$91.38

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *BRICK/PLASTER/CEMENT MASON - Local 3 Quincy*

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.88	$11.39	$22.09	$0.00	$61.36
2	60	$33.45	$11.39	$22.09	$0.00	$66.93
3	70	$39.03	$11.39	$22.09	$0.00	$72.51
4	80	$44.60	$11.39	$22.09	$0.00	$78.08
5	90	$50.18	$11.39	$22.09	$0.00	$83.66

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.58	$11.39	$22.25	$0.00	$62.22
2	60	$34.29	$11.39	$22.25	$0.00	$67.93
3	70	$40.01	$11.39	$22.25	$0.00	$73.65
4	80	$45.72	$11.39	$22.25	$0.00	$79.36
5	90	$51.44	$11.39	$22.25	$0.00	$85.08

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN *LABORERS - FOUNDATION AND MARINE*	06/01/2021	$41.82	$8.60	$17.72	$0.00	$68.14
	12/01/2021	$42.83	$8.60	$17.72	$0.00	$69.15
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER *LABORERS - FOUNDATION AND MARINE*	06/01/2021	$40.67	$8.60	$17.72	$0.00	$66.99
	12/01/2021	$41.68	$8.60	$17.72	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN *LABORERS - FOUNDATION AND MARINE*	06/01/2021	$40.67	$8.60	$17.72	$0.00	$66.99
	12/01/2021	$41.68	$8.60	$17.72	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
CARPENTER *CARPENTERS -ZONE 2 (Eastern Massachusetts)*	03/01/2021	$43.54	$9.40	$18.95	$0.00	$71.89
	09/01/2021	$44.19	$9.40	$18.95	$0.00	$72.54
	03/01/2022	$44.79	$9.40	$18.95	$0.00	$73.14
	09/01/2022	$45.44	$9.40	$18.95	$0.00	$73.79
	03/01/2023	$46.04	$9.40	$18.95	$0.00	$74.39

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CARPENTER - Zone 2 Eastern MA*

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.77	$9.40	$1.73	$0.00	$32.90
2	60	$26.12	$9.40	$1.73	$0.00	$37.25
3	70	$30.48	$9.40	$13.76	$0.00	$53.64
4	75	$32.66	$9.40	$13.76	$0.00	$55.82
5	80	$34.83	$9.40	$15.49	$0.00	$59.72
6	80	$34.83	$9.40	$15.49	$0.00	$59.72
7	90	$39.19	$9.40	$17.22	$0.00	$65.81
8	90	$39.19	$9.40	$17.22	$0.00	$65.81

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.10	$9.40	$1.73	$0.00	$33.23
2	60	$26.51	$9.40	$1.73	$0.00	$37.64
3	70	$30.93	$9.40	$13.76	$0.00	$54.09
4	75	$33.14	$9.40	$13.76	$0.00	$56.30
5	80	$35.35	$9.40	$15.49	$0.00	$60.24
6	80	$35.35	$9.40	$15.49	$0.00	$60.24
7	90	$39.77	$9.40	$17.22	$0.00	$66.39
8	90	$39.77	$9.40	$17.22	$0.00	$66.39

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $30.72/ 3&4 $36.75/ 5&6 $55.37/ 7&8 $61.45

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME *CARPENTERS-ZONE 3 (Wood Frame)*	04/01/2021	$23.16	$7.21	$4.80	$0.00	$35.17
	04/01/2022	$23.66	$7.21	$4.80	$0.00	$35.67
	04/01/2023	$24.16	$7.21	$4.80	$0.00	$36.17

All Aspects of New Wood Frame Work

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CARPENTER (Wood Frame) - Zone 3*

Effective Date - 04/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$13.90	$7.21	$0.00	$0.00	$21.11
2	60	$13.90	$7.21	$0.00	$0.00	$21.11
3	65	$15.05	$7.21	$0.00	$0.00	$22.26
4	70	$16.21	$7.21	$0.00	$0.00	$23.42
5	75	$17.37	$7.21	$3.80	$0.00	$28.38
6	80	$18.53	$7.21	$3.80	$0.00	$29.54
7	85	$19.69	$7.21	$3.80	$0.00	$30.70
8	90	$20.84	$7.21	$3.80	$0.00	$31.85

Effective Date - 04/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$14.20	$7.21	$0.00	$0.00	$21.41
2	60	$14.20	$7.21	$0.00	$0.00	$21.41
3	65	$15.38	$7.21	$0.00	$0.00	$22.59
4	70	$16.56	$7.21	$0.00	$0.00	$23.77
5	75	$17.75	$7.21	$3.80	$0.00	$28.76
6	80	$18.93	$7.21	$3.80	$0.00	$29.94
7	85	$20.11	$7.21	$3.80	$0.00	$31.12
8	90	$21.29	$7.21	$3.80	$0.00	$32.30

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $17.63/ 3&4 $19.95/ 5&6 $27.22/ 7&8 $29.54

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING *BRICKLAYERS LOCAL 3 (QUINCY)*	01/01/2020	$49.07	$12.75	$22.41	$0.62	$84.85

Apprentice - *CEMENT MASONRY/PLASTERING - Eastern Mass (Quincy)*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.54	$12.75	$15.41	$0.00	$52.70
2	60	$29.44	$12.75	$17.41	$0.62	$60.22
3	65	$31.90	$12.75	$18.41	$0.62	$63.68
4	70	$34.35	$12.75	$19.41	$0.62	$67.13
5	75	$36.80	$12.75	$20.41	$0.62	$70.58
6	80	$39.26	$12.75	$21.41	$0.62	$74.04
7	90	$44.16	$12.75	$22.41	$0.62	$79.94

Notes:

Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CHAIN SAW OPERATOR *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$51.73	$13.75	$15.80	$0.00	$81.28
	12/01/2021	$52.88	$13.75	$15.80	$0.00	$82.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$33.40	$13.75	$15.80	$0.00	$62.95
	12/01/2021	$34.19	$13.75	$15.80	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2021	$52.06	$8.25	$22.75	$0.00	$83.06

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.03	$8.25	$0.00	$0.00	$34.28
2	55	$28.63	$8.25	$6.16	$0.00	$43.04
3	60	$31.24	$8.25	$6.72	$0.00	$46.21
4	65	$33.84	$8.25	$7.28	$0.00	$49.37
5	70	$36.44	$8.25	$19.39	$0.00	$64.08
6	75	$39.05	$8.25	$19.95	$0.00	$67.25
7	80	$41.65	$8.25	$20.51	$0.00	$70.41
8	90	$46.85	$8.25	$21.63	$0.00	$76.73

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN *LABORERS - ZONE 2*	06/01/2021	$40.82	$8.60	$17.57	$0.00	$66.99
	12/01/2021	$41.83	$8.60	$17.57	$0.00	$68.00
	06/01/2022	$42.83	$8.60	$17.57	$0.00	$69.00
	12/01/2022	$43.83	$8.60	$17.57	$0.00	$70.00
	06/01/2023	$44.83	$8.60	$17.57	$0.00	$71.00
	12/01/2023	$46.08	$8.60	$17.57	$0.00	$72.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR *LABORERS - ZONE 2*	06/01/2021	$41.82	$8.60	$17.57	$0.00	$67.99
	12/01/2021	$42.83	$8.60	$17.57	$0.00	$69.00
	06/01/2022	$43.83	$8.60	$17.57	$0.00	$70.00
	12/01/2022	$44.83	$8.60	$17.57	$0.00	$71.00
	06/01/2023	$45.83	$8.60	$17.57	$0.00	$72.00
	12/01/2023	$47.08	$8.60	$17.57	$0.00	$73.25
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: BURNERS *LABORERS - ZONE 2*	06/01/2021	$41.57	$8.60	$17.57	$0.00	$67.74
	12/01/2021	$42.58	$8.60	$17.57	$0.00	$68.75
	06/01/2022	$43.58	$8.60	$17.57	$0.00	$69.75
	12/01/2022	$44.58	$8.60	$17.57	$0.00	$70.75
	06/01/2023	$45.58	$8.60	$17.57	$0.00	$71.75
	12/01/2023	$46.83	$8.60	$17.57	$0.00	$73.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER *LABORERS - ZONE 2*	06/01/2021	$41.82	$8.60	$17.57	$0.00	$67.99
	12/01/2021	$42.83	$8.60	$17.57	$0.00	$69.00
	06/01/2022	$43.83	$8.60	$17.57	$0.00	$70.00
	12/01/2022	$44.83	$8.60	$17.57	$0.00	$71.00
	06/01/2023	$45.83	$8.60	$17.57	$0.00	$72.00
	12/01/2023	$47.08	$8.60	$17.57	$0.00	$73.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR *LABORERS - ZONE 2*	06/01/2021	$41.57	$8.60	$17.57	$0.00	$67.74
	12/01/2021	$42.58	$8.60	$17.57	$0.00	$68.75
	06/01/2022	$43.58	$8.60	$17.57	$0.00	$69.75
	12/01/2022	$44.58	$8.60	$17.57	$0.00	$70.75
	06/01/2023	$45.58	$8.60	$17.57	$0.00	$71.75
	12/01/2023	$46.83	$8.60	$17.57	$0.00	$73.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER *LABORERS - ZONE 2*	06/01/2021	$40.82	$8.60	$17.57	$0.00	$66.99
	12/01/2021	$41.83	$8.60	$17.57	$0.00	$68.00
	06/01/2022	$42.83	$8.60	$17.57	$0.00	$69.00
	12/01/2022	$43.83	$8.60	$17.57	$0.00	$70.00
	06/01/2023	$44.83	$8.60	$17.57	$0.00	$71.00
	12/01/2023	$46.08	$8.60	$17.57	$0.00	$72.25
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$68.70	$9.40	$23.12	$0.00	$101.22
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$49.07	$9.40	$23.12	$0.00	$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$73.60	$9.40	$23.12	$0.00	$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$103.05	$9.40	$23.12	$0.00	$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) *DRAWBRIDGE - SEIU LOCAL 888*	07/01/2020	$26.77	$6.67	$3.93	$0.16	$37.53
ELECTRICIAN *ELECTRICIANS LOCAL 223*	09/01/2020	$43.66	$10.90	$14.66	$0.00	$69.22

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELECTRICIAN - Local 223*

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.46	$10.90	$0.52	$0.00	$28.88
2	45	$19.65	$10.90	$0.59	$0.00	$31.14
3	50	$21.83	$10.90	$0.65	$0.00	$33.38
4	55	$24.01	$10.90	$6.28	$0.00	$41.19
5	60	$26.20	$10.90	$6.77	$0.00	$43.87
6	65	$28.38	$10.90	$7.24	$0.00	$46.52
7	70	$30.56	$10.90	$7.73	$0.00	$49.19
8	75	$32.75	$10.90	$8.21	$0.00	$51.86

Notes:

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2021	$63.47	$15.88	$19.31	$0.00	$98.66
	01/01/2022	$65.62	$16.03	$20.21	$0.00	$101.86

Apprentice - *ELEVATOR CONSTRUCTOR - Local 4*

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$31.74	$15.88	$0.00	$0.00	$47.62
2	55	$34.91	$15.88	$19.31	$0.00	$70.10
3	65	$41.26	$15.88	$19.31	$0.00	$76.45
4	70	$44.43	$15.88	$19.31	$0.00	$79.62
5	80	$50.78	$15.88	$19.31	$0.00	$85.97

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.81	$16.03	$0.00	$0.00	$48.84
2	55	$36.09	$16.03	$20.21	$0.00	$72.33
3	65	$42.65	$16.03	$20.21	$0.00	$78.89
4	70	$45.93	$16.03	$20.21	$0.00	$82.17
5	80	$52.50	$16.03	$20.21	$0.00	$88.74

Notes:

Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2021	$44.43	$15.88	$19.31	$0.00	$79.62
	01/01/2022	$45.93	$16.03	$20.21	$0.00	$82.17

For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FENCE & GUARD RAIL ERECTOR *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2021	$45.88	$13.50	$15.70	$0.00	$75.08
	11/01/2021	$46.88	$13.50	$15.70	$0.00	$76.08
	05/01/2022	$48.03	$13.50	$15.70	$0.00	$77.23
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2021	$47.40	$13.50	$15.70	$0.00	$76.60
	11/01/2021	$48.41	$13.50	$15.70	$0.00	$77.61
	05/01/2022	$49.57	$13.50	$15.70	$0.00	$78.77
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2021	$22.91	$13.50	$15.70	$0.00	$52.11
	11/01/2021	$23.51	$13.50	$15.70	$0.00	$52.71
	05/01/2022	$24.18	$13.50	$15.70	$0.00	$53.38
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER *ELECTRICIANS LOCAL 223*	09/01/2020	$43.66	$10.90	$14.66	$0.00	$69.22
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING*ELECTRICIANS LOCAL 223*	09/01/2020	$36.86	$10.90	$12.45	$0.00	$60.21
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$41.31	$13.75	$15.80	$0.00	$70.86
	12/01/2021	$42.26	$13.75	$15.80	$0.00	$71.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$24.50	$8.60	$16.64	$0.00	$49.74
	12/01/2021	$24.50	$8.60	$16.64	$0.00	$49.74
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE I*	03/01/2021	$48.59	$9.40	$19.25	$0.00	$77.24
	09/01/2021	$49.39	$9.40	$19.25	$0.00	$78.04
	03/01/2022	$50.19	$9.40	$19.25	$0.00	$78.84

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *FLOORCOVERER - Local 2168 Zone I*

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.30	$9.40	$1.79	$0.00	$35.49
2	55	$26.72	$9.40	$1.79	$0.00	$37.91
3	60	$29.15	$9.40	$13.88	$0.00	$52.43
4	65	$31.58	$9.40	$13.88	$0.00	$54.86
5	70	$34.01	$9.40	$15.67	$0.00	$59.08
6	75	$36.44	$9.40	$15.67	$0.00	$61.51
7	80	$38.87	$9.40	$17.46	$0.00	$65.73
8	85	$41.30	$9.40	$17.46	$0.00	$68.16

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.70	$9.40	$1.79	$0.00	$35.89
2	55	$27.16	$9.40	$1.79	$0.00	$38.35
3	60	$29.63	$9.40	$13.88	$0.00	$52.91
4	65	$32.10	$9.40	$13.88	$0.00	$55.38
5	70	$34.57	$9.40	$15.67	$0.00	$59.64
6	75	$37.04	$9.40	$15.67	$0.00	$62.11
7	80	$39.51	$9.40	$17.46	$0.00	$66.37
8	85	$41.98	$9.40	$17.46	$0.00	$68.84

Notes: Steps are 750 hrs.
% After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
Step 1&2 $33.03/ 3&4 $39.64/ 5&6 $59.08/ 7&8 $65.73

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.73	$13.75	$15.80	$0.00	$80.28
	12/01/2021	$51.88	$13.75	$15.80	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$33.40	$13.75	$15.80	$0.00	$62.95
	12/01/2021	$34.19	$13.75	$15.80	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) *GLAZIERS LOCAL 1333*	06/01/2020	$39.18	$10.80	$10.45	$0.00	$60.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *GLAZIER - Local 1333*

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.59	$10.80	$1.80	$0.00	$32.19
2	56	$22.04	$10.80	$1.80	$0.00	$34.64
3	63	$24.49	$10.80	$2.45	$0.00	$37.74
4	69	$26.94	$10.80	$2.45	$0.00	$40.19
5	75	$29.39	$10.80	$3.15	$0.00	$43.34
6	81	$31.83	$10.80	$3.15	$0.00	$45.78
7	88	$34.28	$10.80	$10.45	$0.00	$55.53
8	94	$36.73	$10.80	$10.45	$0.00	$57.98

Notes:

Apprentice to Journeyworker Ratio:1:3

HOISTING ENGINEER/CRANES/GRADALLS *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.73	$13.75	$15.80	$0.00	$80.28
	12/01/2021	$51.88	$13.75	$15.80	$0.00	$81.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *OPERATING ENGINEERS - Local 4*

Effective Date - 06/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$27.90	$13.75	$0.00	$0.00	$41.65
2	60	$30.44	$13.75	$15.80	$0.00	$59.99
3	65	$32.97	$13.75	$15.80	$0.00	$62.52
4	70	$35.51	$13.75	$15.80	$0.00	$65.06
5	75	$38.05	$13.75	$15.80	$0.00	$67.60
6	80	$40.58	$13.75	$15.80	$0.00	$70.13
7	85	$43.12	$13.75	$15.80	$0.00	$72.67
8	90	$45.66	$13.75	$15.80	$0.00	$75.21

Effective Date - 12/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$28.53	$13.75	$0.00	$0.00	$42.28
2	60	$31.13	$13.75	$15.80	$0.00	$60.68
3	65	$33.72	$13.75	$15.80	$0.00	$63.27
4	70	$36.32	$13.75	$15.80	$0.00	$65.87
5	75	$38.91	$13.75	$15.80	$0.00	$68.46
6	80	$41.50	$13.75	$15.80	$0.00	$71.05
7	85	$44.10	$13.75	$15.80	$0.00	$73.65
8	90	$46.69	$13.75	$15.80	$0.00	$76.24

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2021	$51.67	$13.65	$24.57	$2.70	$92.59
	08/01/2021	$53.42	$13.65	$24.57	$2.75	$94.39
	02/01/2022	$55.17	$13.65	$24.57	$2.80	$96.19
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) *ELECTRICIANS LOCAL 223*	09/01/2020	$43.66	$10.90	$14.66	$0.00	$69.22
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2021	$51.67	$13.65	$24.57	$2.70	$92.59
	08/01/2021	$53.42	$13.65	$24.57	$2.75	$94.39
	02/01/2022	$55.17	$13.65	$24.57	$2.80	$96.19
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) *PLUMBERS & PIPEFITTERS LOCAL 51*	08/31/2020	$44.69	$10.15	$19.80	$0.00	$74.64
	08/30/2021	$46.69	$10.15	$19.80	$0.00	$76.64
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC *PLUMBERS & PIPEFITTERS LOCAL 51*	08/31/2020	$44.69	$10.15	$19.80	$0.00	$74.64
	08/30/2021	$46.69	$10.15	$19.80	$0.00	$76.64
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HYDRAULIC DRILLS *LABORERS - ZONE 2*	06/01/2021	$35.75	$8.60	$16.64	$0.00	$60.99
	12/01/2021	$36.66	$8.60	$16.64	$0.00	$61.90
	06/01/2022	$37.56	$8.60	$16.64	$0.00	$62.80
	12/01/2022	$38.41	$8.60	$16.64	$0.00	$63.65
	06/01/2023	$39.31	$8.60	$16.64	$0.00	$64.55
	12/01/2023	$40.21	$8.60	$16.64	$0.00	$65.45
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.75	$8.60	$16.64	$0.00	$60.99
	12/01/2021	$36.66	$8.60	$16.64	$0.00	$61.90
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (BOSTON)*	09/01/2020	$49.00	$13.80	$17.14	$0.00	$79.94
	09/01/2021	$51.40	$13.80	$17.14	$0.00	$82.34
	09/01/2022	$53.85	$13.80	$17.14	$0.00	$84.79

Apprentice - *ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston*

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.50	$13.80	$12.42	$0.00	$50.72
2	60	$29.40	$13.80	$13.36	$0.00	$56.56
3	70	$34.30	$13.80	$14.31	$0.00	$62.41
4	80	$39.20	$13.80	$15.25	$0.00	$68.25

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.70	$13.80	$12.42	$0.00	$51.92
2	60	$30.84	$13.80	$13.36	$0.00	$58.00
3	70	$35.98	$13.80	$14.31	$0.00	$64.09
4	80	$41.12	$13.80	$15.25	$0.00	$70.17

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER *IRONWORKERS LOCAL 37*	03/16/2021	$42.46	$7.70	$17.10	$0.00	$67.26

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *IRONWORKER - Local 37*

Effective Date - 03/16/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	70	$29.72	$7.70	$17.10	$0.00	$54.52
2	75	$31.85	$7.70	$17.10	$0.00	$56.65
3	80	$33.97	$7.70	$17.10	$0.00	$58.77
4	85	$36.09	$7.70	$17.10	$0.00	$60.89
5	90	$38.21	$7.70	$17.10	$0.00	$63.01
6	95	$40.34	$7.70	$17.10	$0.00	$65.14

Notes:

Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
LABORER *LABORERS - ZONE 2*	06/01/2021	$35.00	$8.60	$16.64	$0.00	$60.24
	12/01/2021	$35.91	$8.60	$16.64	$0.00	$61.15
	06/01/2022	$36.81	$8.60	$16.64	$0.00	$62.05
	12/01/2022	$37.66	$8.60	$16.64	$0.00	$62.90
	06/01/2023	$38.56	$8.60	$16.64	$0.00	$63.80
	12/01/2023	$39.46	$8.60	$16.64	$0.00	$64.70

Apprentice - *LABORER - Zone 2*

Effective Date - 06/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$21.00	$8.60	$16.64	$0.00	$46.24
2	70	$24.50	$8.60	$16.64	$0.00	$49.74
3	80	$28.00	$8.60	$16.64	$0.00	$53.24
4	90	$31.50	$8.60	$16.64	$0.00	$56.74

Effective Date - 12/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$21.55	$8.60	$16.64	$0.00	$46.79
2	70	$25.14	$8.60	$16.64	$0.00	$50.38
3	80	$28.73	$8.60	$16.64	$0.00	$53.97
4	90	$32.32	$8.60	$16.64	$0.00	$57.56

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.00	$8.60	$16.64	$0.00	$60.24
	12/01/2021	$35.91	$8.60	$16.64	$0.00	$61.15

Apprentice - *LABORER (Heavy & Highway) - Zone 2*

Effective Date - 06/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$21.00	$8.60	$16.64	$0.00	$46.24
2	70	$24.50	$8.60	$16.64	$0.00	$49.74
3	80	$28.00	$8.60	$16.64	$0.00	$53.24
4	90	$31.50	$8.60	$16.64	$0.00	$56.74

Effective Date - 12/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$21.55	$8.60	$16.64	$0.00	$46.79
2	70	$25.14	$8.60	$16.64	$0.00	$50.38
3	80	$28.73	$8.60	$16.64	$0.00	$53.97
4	90	$32.32	$8.60	$16.64	$0.00	$57.56

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CARPENTER TENDER *LABORERS - ZONE 2*	06/01/2021	$35.00	$8.60	$16.64	$0.00	$60.24
	12/01/2021	$35.91	$8.60	$16.64	$0.00	$61.15
	06/01/2022	$36.81	$8.60	$16.64	$0.00	$62.05
	12/01/2022	$37.66	$8.60	$16.64	$0.00	$62.90
	06/01/2023	$38.56	$8.60	$16.64	$0.00	$63.80
	12/01/2023	$39.46	$8.60	$16.64	$0.00	$64.70
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 2*	06/01/2021	$35.00	$8.60	$16.64	$0.00	$60.24
	12/01/2021	$35.91	$8.60	$16.64	$0.00	$61.15
	06/01/2022	$36.81	$8.60	$16.64	$0.00	$62.05
	12/01/2022	$37.66	$8.60	$16.64	$0.00	$62.90
	06/01/2023	$38.56	$8.60	$16.64	$0.00	$63.80
	12/01/2023	$39.46	$8.60	$16.64	$0.00	$64.70
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 2*	06/01/2021	$35.09	$8.60	$16.70	$0.00	$60.39
	12/01/2021	$36.00	$8.60	$16.70	$0.00	$61.30
	06/01/2022	$36.90	$8.60	$16.70	$0.00	$62.20
	12/01/2022	$37.75	$8.60	$16.70	$0.00	$63.05
	06/01/2023	$38.65	$8.60	$16.70	$0.00	$63.95
	12/01/2023	$39.55	$8.60	$16.70	$0.00	$64.85
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
LABORER: MULTI-TRADE TENDER *LABORERS - ZONE 2*	06/01/2021	$35.00	$8.60	$16.64	$0.00	$60.24
	12/01/2021	$35.91	$8.60	$16.64	$0.00	$61.15
	06/01/2022	$36.81	$8.60	$16.64	$0.00	$62.05
	12/01/2022	$37.66	$8.60	$16.64	$0.00	$62.90
	06/01/2023	$38.56	$8.60	$16.64	$0.00	$63.80
	12/01/2023	$39.46	$8.60	$16.64	$0.00	$64.70
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER *LABORERS - ZONE 2*	06/01/2021	$35.00	$8.60	$16.64	$0.00	$60.24
	12/01/2021	$35.91	$8.60	$16.64	$0.00	$61.15
	06/01/2022	$36.81	$8.60	$16.64	$0.00	$62.05
	12/01/2022	$37.66	$8.60	$16.64	$0.00	$62.90
	06/01/2023	$38.56	$8.60	$16.64	$0.00	$63.80
	12/01/2023	$39.46	$8.60	$16.64	$0.00	$64.70
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LASER BEAM OPERATOR	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
LABORERS - ZONE 2	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY)	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS	02/01/2021	$42.57	$11.39	$20.14	$0.00	$74.10
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2021	$43.69	$11.39	$20.30	$0.00	$75.38
	02/01/2022	$44.16	$11.39	$20.30	$0.00	$75.85

Apprentice - *MARBLE & TILE FINISHER - Local 3 Marble & Tile*

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.29	$11.39	$20.14	$0.00	$52.82
2	60	$25.54	$11.39	$20.14	$0.00	$57.07
3	70	$29.80	$11.39	$20.14	$0.00	$61.33
4	80	$34.06	$11.39	$20.14	$0.00	$65.59
5	90	$38.31	$11.39	$20.14	$0.00	$69.84

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.85	$11.39	$20.30	$0.00	$53.54
2	60	$26.21	$11.39	$20.30	$0.00	$57.90
3	70	$30.58	$11.39	$20.30	$0.00	$62.27
4	80	$34.95	$11.39	$20.30	$0.00	$66.64
5	90	$39.32	$11.39	$20.30	$0.00	$71.01

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS,TILELAYERS & TERRAZZO MECH	02/01/2021	$55.77	$11.39	$22.08	$0.00	$89.24
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2021	$57.17	$11.39	$22.24	$0.00	$90.80
	02/01/2022	$57.74	$11.39	$22.24	$0.00	$91.37

Apprentice - *MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile*

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.89	$11.39	$22.08	$0.00	$61.36
2	60	$33.46	$11.39	$22.08	$0.00	$66.93
3	70	$39.04	$11.39	$22.08	$0.00	$72.51
4	80	$44.62	$11.39	$22.08	$0.00	$78.09
5	90	$50.19	$11.39	$22.08	$0.00	$83.66

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.59	$11.39	$22.24	$0.00	$62.22
2	60	$34.30	$11.39	$22.24	$0.00	$67.93
3	70	$40.02	$11.39	$22.24	$0.00	$73.65
4	80	$45.74	$11.39	$22.24	$0.00	$79.37
5	90	$51.45	$11.39	$22.24	$0.00	$85.08

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 2) *MILLWRIGHTS LOCAL 1121 - Zone 2*	03/01/2021	$39.42	$8.58	$21.57	$0.00	$69.57
	01/03/2022	$40.67	$8.58	$21.57	$0.00	$70.82
	01/02/2023	$41.92	$8.58	$21.57	$0.00	$72.07

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MILLWRIGHT - Local 1121 Zone 2*

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$21.68	$8.58	$5.72	$0.00	$35.98
2	65	$25.62	$8.58	$17.93	$0.00	$52.13
3	75	$29.57	$8.58	$18.98	$0.00	$57.13
4	85	$33.51	$8.58	$20.01	$0.00	$62.10

Effective Date - 01/03/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$22.37	$8.58	$5.72	$0.00	$36.67
2	65	$26.44	$8.58	$17.93	$0.00	$52.95
3	75	$30.50	$8.58	$18.98	$0.00	$58.06
4	85	$34.57	$8.58	$20.01	$0.00	$63.16

Notes: Step 1&2 Appr. indentured after 1/6/2020 receive no pension, but do receive annuity. (Step 1 $5.72, Step 2 $6.66)
Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

MORTAR MIXER *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS) *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$23.40	$13.75	$15.80	$0.00	$52.95
	12/01/2021	$23.98	$13.75	$15.80	$0.00	$53.53
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$28.26	$13.75	$15.80	$0.00	$57.81
	12/01/2021	$28.94	$13.75	$15.80	$0.00	$58.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS II *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2021	$52.06	$8.25	$22.75	$0.00	$83.06

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.03	$8.25	$0.00	$0.00	$34.28
2	55	$28.63	$8.25	$6.16	$0.00	$43.04
3	60	$31.24	$8.25	$6.72	$0.00	$46.21
4	65	$33.84	$8.25	$7.28	$0.00	$49.37
5	70	$36.44	$8.25	$19.39	$0.00	$64.08
6	75	$39.05	$8.25	$19.95	$0.00	$67.25
7	80	$41.65	$8.25	$20.51	$0.00	$70.41
8	90	$46.85	$8.25	$21.63	$0.00	$76.73

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) * * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	01/01/2021	$42.96	$8.25	$22.75	$0.00	$73.96

Apprentice - *PAINTER Local 35 Zone 2 - Spray/Sandblast - New*

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.48	$8.25	$0.00	$0.00	$29.73
2	55	$23.63	$8.25	$6.16	$0.00	$38.04
3	60	$25.78	$8.25	$6.72	$0.00	$40.75
4	65	$27.92	$8.25	$7.28	$0.00	$43.45
5	70	$30.07	$8.25	$19.39	$0.00	$57.71
6	75	$32.22	$8.25	$19.95	$0.00	$60.42
7	80	$34.37	$8.25	$20.51	$0.00	$63.13
8	90	$38.66	$8.25	$21.63	$0.00	$68.54

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2021	$41.02	$8.25	$22.75	$0.00	$72.02

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint*

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.51	$8.25	$0.00	$0.00	$28.76
2	55	$22.56	$8.25	$6.16	$0.00	$36.97
3	60	$24.61	$8.25	$6.72	$0.00	$39.58
4	65	$26.66	$8.25	$7.28	$0.00	$42.19
5	70	$28.71	$8.25	$19.39	$0.00	$56.35
6	75	$30.77	$8.25	$19.95	$0.00	$58.97
7	80	$32.82	$8.25	$20.51	$0.00	$61.58
8	90	$36.92	$8.25	$21.63	$0.00	$66.80

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, NEW) *	01/01/2021	$41.56	$8.25	$22.75	$0.00	$72.56

* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*

Apprentice - *PAINTER - Local 35 Zone 2 - BRUSH NEW*

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.78	$8.25	$0.00	$0.00	$29.03
2	55	$22.86	$8.25	$6.16	$0.00	$37.27
3	60	$24.94	$8.25	$6.72	$0.00	$39.91
4	65	$27.01	$8.25	$7.28	$0.00	$42.54
5	70	$29.09	$8.25	$19.39	$0.00	$56.73
6	75	$31.17	$8.25	$19.95	$0.00	$59.37
7	80	$33.25	$8.25	$20.51	$0.00	$62.01
8	90	$37.40	$8.25	$21.63	$0.00	$67.28

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2021	$39.62	$8.25	$22.75	$0.00	$70.62

Apprentice - *PAINTER Local 35 Zone 2 - BRUSH REPAINT*

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.81	$8.25	$0.00	$0.00	$28.06
2	55	$21.79	$8.25	$6.16	$0.00	$36.20
3	60	$23.77	$8.25	$6.72	$0.00	$38.74
4	65	$25.75	$8.25	$7.28	$0.00	$41.28
5	70	$27.73	$8.25	$19.39	$0.00	$55.37
6	75	$29.72	$8.25	$19.95	$0.00	$57.92
7	80	$31.70	$8.25	$20.51	$0.00	$60.46
8	90	$35.66	$8.25	$21.63	$0.00	$65.54

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)* For apprentice rates see "Apprentice- LABORER (Heavy and Highway)	06/01/2021	$35.00	$8.60	$16.64	$0.00	$60.24
	12/01/2021	$35.91	$8.60	$16.64	$0.00	$61.15
PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$35.78	$12.91	$14.82	$0.00	$63.51
	08/01/2021	$35.78	$13.41	$14.82	$0.00	$64.01
	12/01/2021	$35.78	$13.41	$16.01	$0.00	$65.20
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) *PILE DRIVER LOCAL 56 (ZONE 1)* For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2020	$49.07	$9.40	$23.12	$0.00	$81.59
PILE DRIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$49.07	$9.40	$23.12	$0.00	$81.59

Apprentice - *PILE DRIVER - Local 56 Zone 1*

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.54	$9.40	$23.12	$0.00	$57.06
2	60	$29.44	$9.40	$23.12	$0.00	$61.96
3	70	$34.35	$9.40	$23.12	$0.00	$66.87
4	75	$36.80	$9.40	$23.12	$0.00	$69.32
5	80	$39.26	$9.40	$23.12	$0.00	$71.78
6	80	$39.26	$9.40	$23.12	$0.00	$71.78
7	90	$44.16	$9.40	$23.12	$0.00	$76.68
8	90	$44.16	$9.40	$23.12	$0.00	$76.68

Notes:
% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $34.01/ 3&4 $41.46/ 5&6 $62.80/ 7&8 $69.25

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIPELAYER *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
PIPELAYER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PLUMBER & PIPEFITTER *PLUMBERS & PIPEFITTERS LOCAL 51*	08/31/2020	$44.69	$10.15	$19.80	$0.00	$74.64
	08/30/2021	$46.69	$10.15	$19.80	$0.00	$76.64

Apprentice - *PLUMBER/PIPEFITTER - Local 51*

Effective Date - 08/31/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.88	$10.15	$2.50	$0.00	$30.53
2	50	$22.35	$10.15	$2.50	$0.00	$35.00
3	60	$26.81	$10.15	$8.73	$0.00	$45.69
4	70	$31.28	$10.15	$10.60	$0.00	$52.03
5	80	$35.75	$10.15	$17.45	$0.00	$63.35

Effective Date - 08/30/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$18.68	$10.15	$2.50	$0.00	$31.33
2	50	$23.35	$10.15	$2.50	$0.00	$36.00
3	60	$28.01	$10.15	$8.73	$0.00	$46.89
4	70	$32.68	$10.15	$10.60	$0.00	$53.43
5	80	$37.35	$10.15	$17.45	$0.00	$64.95

Notes:
Steps 2000hrs. Prior 9/1/05; 40/40/45/50/55/60/65/75/80/85

Apprentice to Journeyworker Ratio:1:3

PNEUMATIC CONTROLS (TEMP.) *PLUMBERS & PIPEFITTERS LOCAL 51*	08/31/2020	$44.69	$10.15	$19.80	$0.00	$74.64
	08/30/2021	$46.69	$10.15	$19.80	$0.00	$76.64
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWDERMAN & BLASTER	06/01/2021	$36.00	$8.60	$16.64	$0.00	$61.24
LABORERS - ZONE 2	12/01/2021	$36.91	$8.60	$16.64	$0.00	$62.15
	06/01/2022	$37.81	$8.60	$16.64	$0.00	$63.05
	12/01/2022	$38.66	$8.60	$16.64	$0.00	$63.90
	06/01/2023	$39.56	$8.60	$16.64	$0.00	$64.80
	12/01/2023	$40.46	$8.60	$16.64	$0.00	$65.70
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY)	06/01/2021	$36.00	$8.60	$16.64	$0.00	$61.24
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2021	$36.91	$8.60	$16.64	$0.00	$62.15
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWER SHOVEL/DERRICK/TRENCHING MACHINE	06/01/2021	$50.73	$13.75	$15.80	$0.00	$80.28
OPERATING ENGINEERS LOCAL 4	12/01/2021	$51.88	$13.75	$15.80	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE)	06/01/2021	$50.73	$13.75	$15.80	$0.00	$80.28
OPERATING ENGINEERS LOCAL 4	12/01/2021	$51.88	$13.75	$15.80	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER)	06/01/2021	$33.40	$13.75	$15.80	$0.00	$62.95
OPERATING ENGINEERS LOCAL 4	12/01/2021	$34.19	$13.75	$15.80	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RECLAIMERS	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
OPERATING ENGINEERS LOCAL 4	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
LABORERS - ZONE 2	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
OPERATING ENGINEERS LOCAL 4	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)	02/01/2021	$46.60	$12.28	$17.15	$0.00	$76.03
ROOFERS LOCAL 33	08/01/2021	$48.03	$12.28	$17.15	$0.00	$77.46
	02/01/2022	$49.46	$12.28	$17.15	$0.00	$78.89

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ROOFER - Local 33*

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.30	$12.28	$4.31	$0.00	$39.89
2	60	$27.96	$12.28	$17.15	$0.00	$57.39
3	65	$30.29	$12.28	$17.15	$0.00	$59.72
4	75	$34.95	$12.28	$17.15	$0.00	$64.38
5	85	$39.61	$12.28	$17.15	$0.00	$69.04

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.02	$12.28	$4.31	$0.00	$40.61
2	60	$28.82	$12.28	$17.15	$0.00	$58.25
3	65	$31.22	$12.28	$17.15	$0.00	$60.65
4	75	$36.02	$12.28	$17.15	$0.00	$65.45
5	85	$40.83	$12.28	$17.15	$0.00	$70.26

Notes: ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1
Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.
(Hot Pitch Mechanics' receive $1.00 hr. above ROOFER)

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE *ROOFERS LOCAL 33*	02/01/2021	$46.85	$12.28	$17.15	$0.00	$76.28
	08/01/2021	$48.28	$12.28	$17.15	$0.00	$77.71
	02/01/2022	$49.71	$12.28	$17.15	$0.00	$79.14
For apprentice rates see "Apprentice- ROOFER"						
SHEETMETAL WORKER *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2021	$51.67	$13.65	$24.57	$2.70	$92.59
	08/01/2021	$53.42	$13.65	$24.57	$2.75	$94.39
	02/01/2022	$55.17	$13.65	$24.57	$2.80	$96.19

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *SHEET METAL WORKER - Local 17-A*

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	$21.70	$13.65	$5.89	$0.00	$41.24
2	42	$21.70	$13.65	$5.89	$0.00	$41.24
3	47	$24.28	$13.65	$11.13	$1.48	$50.54
4	47	$24.28	$13.65	$11.13	$1.48	$50.54
5	52	$26.87	$13.65	$12.08	$1.58	$54.18
6	52	$26.87	$13.65	$12.33	$1.59	$54.44
7	60	$31.00	$13.65	$13.70	$1.76	$60.11
8	65	$33.59	$13.65	$14.65	$1.88	$63.77
9	75	$38.75	$13.65	$16.56	$2.08	$71.04
10	85	$43.92	$13.65	$17.96	$2.28	$77.81

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	$22.44	$13.65	$5.89	$0.00	$41.98
2	42	$22.44	$13.65	$5.89	$0.00	$41.98
3	47	$25.11	$13.65	$11.13	$1.48	$51.37
4	47	$25.11	$13.65	$11.13	$1.48	$51.37
5	52	$27.78	$13.65	$12.08	$1.58	$55.09
6	52	$27.78	$13.65	$12.33	$1.59	$55.35
7	60	$32.05	$13.65	$13.70	$1.76	$61.16
8	65	$34.72	$13.65	$14.65	$1.88	$64.90
9	75	$40.07	$13.65	$16.56	$2.08	$72.36
10	85	$45.41	$13.65	$17.96	$2.28	$79.30

Notes:
Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SPECIALIZED EARTH MOVING EQUIP < 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$36.24	$12.91	$14.82	$0.00	$63.97
	08/01/2021	$36.24	$13.41	$14.82	$0.00	$64.47
	12/01/2021	$36.24	$13.41	$16.01	$0.00	$65.66
SPECIALIZED EARTH MOVING EQUIP > 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$36.53	$12.91	$14.82	$0.00	$64.26
	08/01/2021	$36.53	$13.41	$14.82	$0.00	$64.76
	12/01/2021	$36.53	$13.41	$16.01	$0.00	$65.95
SPRINKLER FITTER *SPRINKLER FITTERS LOCAL 550 - (Section B) Zone 2*	03/01/2021	$56.21	$10.00	$21.25	$0.00	$87.46

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *SPRINKLER FITTER - Local 550 (Section B) Zone 2*

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$19.67	$10.00	$11.99	$0.00	$41.66
2	40	$22.48	$10.00	$12.70	$0.00	$45.18
3	45	$25.29	$10.00	$13.41	$0.00	$48.70
4	50	$28.11	$10.00	$14.13	$0.00	$52.24
5	55	$30.92	$10.00	$14.84	$0.00	$55.76
6	60	$33.73	$10.00	$15.55	$0.00	$59.28
7	65	$36.54	$10.00	$16.26	$0.00	$62.80
8	70	$39.35	$10.00	$16.98	$0.00	$66.33
9	75	$42.16	$10.00	$17.69	$0.00	$69.85
10	80	$44.97	$10.00	$18.40	$0.00	$73.37

Notes: Apprentice entered prior 9/30/10:
40/45/50/55/60/65/70/75/80/85
Steps are 850 hours

Apprentice to Journeyworker Ratio:1:3

STEAM BOILER OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN *ELECTRICIANS LOCAL 223*	09/01/2020	$36.86	$10.90	$12.45	$0.00	$60.21

Apprentice - *TELECOMMUNICATION TECHNICIAN - Local 223*

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	$0.00	$0.00	$0.00	$0.00	$0.00

Notes: See Electrician Apprentice Wages

Telecom Apprentice Wages shall be the same as the Electrician Apprentice Wages

Apprentice to Journeyworker Ratio:2:3***

TERRAZZO FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2021	$54.69	$11.39	$22.09	$0.00	$88.17
	08/01/2021	$56.09	$11.39	$22.25	$0.00	$89.73
	02/01/2022	$56.68	$11.39	$22.25	$0.00	$90.32

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *TERRAZZO FINISHER - Local 3 Marble & Tile*

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.35	$11.39	$22.09	$0.00	$60.83
2	60	$32.81	$11.39	$22.09	$0.00	$66.29
3	70	$38.28	$11.39	$22.09	$0.00	$71.76
4	80	$43.75	$11.39	$22.09	$0.00	$77.23
5	90	$49.22	$11.39	$22.09	$0.00	$82.70

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.05	$11.39	$22.25	$0.00	$61.69
2	60	$33.65	$11.39	$22.25	$0.00	$67.29
3	70	$39.26	$11.39	$22.25	$0.00	$72.90
4	80	$44.87	$11.39	$22.25	$0.00	$78.51
5	90	$50.48	$11.39	$22.25	$0.00	$84.12

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER *LABORERS - FOUNDATION AND MARINE*	06/01/2021	$42.07	$8.60	$17.72	$0.00	$68.39
	12/01/2021	$43.08	$8.60	$17.72	$0.00	$69.40
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER *LABORERS - FOUNDATION AND MARINE*	06/01/2021	$40.79	$8.60	$17.72	$0.00	$67.11
	12/01/2021	$41.80	$8.60	$17.72	$0.00	$68.12
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER *LABORERS - FOUNDATION AND MARINE*	06/01/2021	$40.67	$8.60	$17.72	$0.00	$66.99
	12/01/2021	$41.68	$8.60	$17.72	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$36.82	$12.91	$14.82	$0.00	$64.55
	08/01/2021	$36.82	$13.41	$14.82	$0.00	$65.05
	12/01/2021	$36.82	$13.41	$16.01	$0.00	$66.24
TUNNEL WORK - COMPRESSED AIR *LABORERS (COMPRESSED AIR)*	06/01/2021	$52.90	$8.60	$18.17	$0.00	$79.67
	12/01/2021	$53.91	$8.60	$18.17	$0.00	$80.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) *LABORERS (COMPRESSED AIR)*	06/01/2021	$54.90	$8.60	$18.17	$0.00	$81.67
	12/01/2021	$55.91	$8.60	$18.17	$0.00	$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR *LABORERS (FREE AIR TUNNEL)*	06/01/2021	$44.97	$8.60	$18.17	$0.00	$71.74
	12/01/2021	$45.98	$8.60	$18.17	$0.00	$72.75
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - FREE AIR (HAZ. WASTE) *LABORERS (FREE AIR TUNNEL)*	06/01/2021	$46.97	$8.60	$18.17	$0.00	$73.74
	12/01/2021	$47.98	$8.60	$18.17	$0.00	$74.75
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$36.24	$12.91	$14.82	$0.00	$63.97
	08/01/2021	$36.24	$13.41	$14.82	$0.00	$64.47
	12/01/2021	$36.24	$13.41	$16.01	$0.00	$65.66
WAGON DRILL OPERATOR *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WASTE WATER PUMP OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.73	$13.75	$15.80	$0.00	$80.28
	12/01/2021	$51.88	$13.75	$15.80	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER *PLUMBERS & PIPEFITTERS LOCAL 51*	08/31/2020	$44.69	$10.15	$19.80	$0.00	$74.64
	08/30/2021	$46.69	$10.15	$19.80	$0.00	$76.64
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$29.67	$9.25	$1.89	$0.00	$40.81
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$42.03	$9.25	$10.27	$0.00	$61.55
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$34.62	$9.25	$10.07	$0.00	$53.94
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$27.20	$9.25	$1.82	$0.00	$38.27
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class A CDL) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$42.03	$9.25	$14.35	$0.00	$65.63
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class B CDL) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$37.09	$9.25	$10.87	$0.00	$57.21
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$27.20	$9.25	$1.82	$0.00	$38.27
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN -Inexperienced (<2000 Hrs.) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$22.25	$9.25	$1.82	$0.00	$33.32
For apprentice rates see "Apprentice- LINEMAN"						
JOURNEYMAN LINEMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$49.45	$9.25	$17.48	$0.00	$76.18

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *LINEMAN (Outside Electrical) - East Local 104*

Effective Date - 08/30/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$29.67	$9.25	$3.39	$0.00	$42.31
2	65	$32.14	$9.25	$3.46	$0.00	$44.85
3	70	$34.62	$9.25	$3.54	$0.00	$47.41
4	75	$37.09	$9.25	$5.11	$0.00	$51.45
5	80	$39.56	$9.25	$5.19	$0.00	$54.00
6	85	$42.03	$9.25	$5.26	$0.00	$56.54
7	90	$44.51	$9.25	$7.34	$0.00	$61.10

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$30.73	$4.70	$3.17	$0.00	$38.60
TELEDATA LINEMAN/EQUIPMENT OPERATOR *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$28.93	$4.70	$3.14	$0.00	$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$28.93	$4.70	$3.14	$0.00	$36.77

Additional Apprentice Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentice ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)
Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

** Multiple ratios are listed in the comment field.
*** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.
**** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

Attachments

Attachment A

MassDEP Order of Conditions (SE# 126-617)

Cranberry Land USA
Carver Conservation Commission
Town Hall, 108 Main Street
Carver, MA 02330
Telephone: 508-866-3482
Fax: 508-866-3430

April 29, 2021

Rick LaFond
108 Main Street
Carver, MA 02330

RE: Order of Conditions – DEP# SE126-617
Montello Street Improvement Project, Carver, MA

Dear Rick:

Enclosed please find a copy of the Order of Conditions for the project (roadway improvements) at the location listed above. The original OOC will be filed at the Plymouth County Registry of Deeds, 50 Obery Street, Plymouth MA 02360. When the OOC has been filed, a copy of the recording information will be sent to you for your records.

When the Town has completed this project, please contact this office to request a Certificate of Compliance (COC) to close out the Project.

If you have any questions or concerns, please do not hesitate to contact me.

Yours truly,

Brooke Monroe, Environmental Scientist
Agent, Carver Conservation Commission

Enc.
CC: DEP
Wayne Amico/Chris Wagner, VHB

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

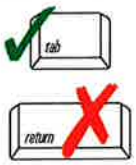
Provided by MassDEP:

MassDEP File #
SE# 126-617
eDEP Transaction #
Carver
City/Town

A. General Information

Please note: this form has been modified with added space to accommodate the Registry of Deeds Requirements

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. From: Carver
Conservation Commission

2. This issuance is for (check one): a. ☒ Order of Conditions b. ☐ Amended Order of Conditions

3. To: Applicant:

Rick
a. First Name

LaFond
b. Last Name

Town of Carver
c. Organization

108 Main Street
d. Mailing Address

Carver
e. City/Town

MA
f. State

02330
g. Zip Code

4. Property Owner (if different from applicant):

Town Street
a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

5. Project Location:

Montello Street
a. Street Address

Carver
b. City/Town

N/A
c. Assessors Map/Plat Number

N/A
d. Parcel/Lot Number

Latitude and Longitude, if known:

41d92854m s
d. Latitude

70d80905m s
e. Longitude

A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Plymouth — a. County
b. Certificate Number (if registered land)
N/A — c. Book
d. Page

7. Dates: March 1, 2021 — a. Date Notice of Intent Filed; April 7, 2021 — b. Date Public Hearing Closed; April 28, 2021 — c. Date of Issuance

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):
Plan revised/signed by the Commission; sheet 12, 23,27 and 28 of the approved/revised Plan; "Transportation Improvement Project, Montello Street in Carver, MA"

Vansse Hangen Brustlin, Inc. — b. Prepared By
Wayn Amico #38724 — c. Signed and Stamped by
April 7, 2021 — d. Final Revision Date
As Noted per Sheet — e. Scale
Notice of Intent, with Stormwater Calculations — f. Additional Plan or Document Title
March 2021 — g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☐ Public Water Supply
b. ☐ Land Containing Shellfish
c. ☒ Prevention of Pollution
d. ☐ Private Water Supply
e. ☐ Fisheries
f. ☒ Protection of Wildlife Habitat
g. ☒ Groundwater Supply
h. ☐ Storm Damage Prevention
i. ☐ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☐ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) _____ a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☒ Bank	106 lf a. linear feet	106lf b. linear feet	 c. linear feet	102lf d. linear feet
5. ☒ Bordering Vegetated Wetland	1928 SF a. square feet	1928 SF b. square feet	2200 SF c. square feet	2200 SF d. square feet
6. ☒ Land Under Waterbodies and Waterways	282 a. square feet	282 b. square feet	362 c. square feet	362 d. square feet
	 e. c/y dredged	 f. c/y dredged		
7. ☐ Bordering Land Subject to Flooding	 a. square feet	 b. square feet	 c. square feet	 d. square feet
Cubic Feet Flood Storage	 e. cubic feet	 f. cubic feet	 g. cubic feet	 h. cubic feet
8. ☐ Isolated Land Subject to Flooding	 a. square feet	 b. square feet		
Cubic Feet Flood Storage	 c. cubic feet	 d. cubic feet	 e. cubic feet	 f. cubic feet
9. ☒ Riverfront Area	66287 a. total sq. feet	66287 b. total sq. feet		
Sq ft within 100 ft	30514 c. square feet	30514 d. square feet	 e. square feet	 f. square feet
Sq ft between 100-200 ft	35773 g. square feet	35773 h. square feet	culvert rep i. square feet	 j. square feet

B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. nourishment (cu yd)	d. nourishment (cu yd)
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. nourishment (cu yd)	d. nourishment (cu yd)
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		

B. Findings (cont.)

* **#22**. If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

22. ☐ Restoration/Enhancement *:

a. square feet of BVW | b. square feet of salt marsh

23. ☐ Stream Crossing(s):

a. number of new stream crossings | b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. the work is a maintenance dredging project as provided for in the Act; or
   b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

    "Massachusetts Department of Environmental Protection" [or, "MassDEP"]

    "File Number SE#126-617 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. **The work associated with this Order (the "Project")** (1) ☐ **is** (2) ☒ **is not subject to the Massachusetts Stormwater Standards. If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:**

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;
iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;
v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: *i.*) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and *ii.*) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

See "Attachment A" Special Conditions

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☒ Yes ☐ No

2. The Carver (Conservation Commission) hereby finds (check one that applies):

   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

   _____ (1. Municipal Ordinance or Bylaw) _____ (2. Citation)

   Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ☒ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

   Carver Wetlands Protection By-law (1. Municipal Ordinance or Bylaw) 9.2 (2. Citation)

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

   See "Attachment A"

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File #
SE# 126-617
eDEP Transaction #
Carver
City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

~~3/17/2021~~ 4/7/2021
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

5
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

☐ by hand delivery on

Date

☒ by certified mail, return receipt requested, on

Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request of Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Carver Conservation Commission
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Carver Conservation Commission
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Montello Street
Project Location

SE# 126-617
MassDEP File Number

Has been recorded at the Registry of Deeds of:

Plymouth
County

Book

Page

for: Town of Carver
Property Owner

and has been noted in the chain of title of the affected property in:

Book

Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

Cranberry Land USA
Carver Conservation Commission
Town Hall, 108 Main Street
Carver, MA 02330
Telephone: 508-866-3482
Fax: 508-866-3430

ATTACHMENT "A"
Special Ongoing Conditions for DEP SE# 126-617
Town of Carver
Montello Street Improvement Project, Carver, Map/Parcel N/A

1. Any changes to the proposed and approved Plan; for activity within the 65-foot and 100-foot buffer zone and/or within the riverfront area; shall require the Applicant (or designated Project Engineer) to contact the Conservation Commission of those changes to determine if those changes require a new filing.
2. As submitted in the NOI (see "Narrative in Support of Notice of Intent for Montello Street Transportation Improvement Project, Carver, MA" (March 2021) the culvert stream crossing will be conducted in accordance with "Attachment D" in the NOI and the wetland replacement area shall be constructed in accordance with the details outlined under "Mitigation Measures", including plantings and monitoring of the replacement area. Any work in the resource areas (LUWW, bank, BVW, riverfront) shall be conducted as further outlined in the NOI.
3. Following the installation of the erosion controls (silt fencing trenched/staked as shown on the Plan); prior to commencement of construction activities; the Conservation Agent shall be notified for a site inspection. The erosion controls shall be maintained in working condition throughout the project and until all disturbed areas are permanently stabilized.
4. All stockpiled material shall be contained within the erosion control barriers. Any excavated material from the project site shall be placed up gradient of the erosion control barrier. There shall be no disturbance and/or placement of equipment on the wetland side of the erosion controls.
5. Servicing of equipment (including, but not limited to, fueling, adding and/or applying lubricants or hydraulic fluids) shall be done outside of the 100-foot buffer from the resource areas on the site. If a spill/release of a hazardous material occurs, the Contractor shall notify the Carver Fire Department and/or the appropriate state/federal agency as required by law.

6. Following completion of the project, Applicant shall submit a Request for a Certificate of Compliance within three (3) years, with an As-Built Plan signed by a Professional Engineer, certifying the project has been completed in accordance with the Notice of Intent and approved Plans. If the project is not completed within three (3) years, the Applicant shall request an Extension of thirty (30) days prior to the expiration date of this Order. The issuance of a COC does not relieve the Applicant and/or his successor from complying Condition #5 of this OOC.
7. No structures, further work, stockpiling of materials, and/or other activity within 100 feet or less of the resource area, other than that permitted by this Order of Conditions, shall be done without notifying the Carver Conservation Commission as to whether another permit is required.
8. Special Conditions #1, #2 and #5 shall not expire with this Order of Conditions.

Attachment B

North Carver Water District
Rules and Regulations

NORTH CARVER WATER DISTRICT
RULES AND REGULATIONS

Adopted July 27, 2010; revised November 2012; revised July 2016; revised April 2019

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North Carver Water District Rules and Regulations

Authority

The Town of Carver's North Carver Water District was established under Chapter 124 of the Acts of 2008 by the Massachusetts legislature. Under Section 4(a) and 5(f) of the District's enabling legislation, the District Commissioners are granted the Authority to establish rules and regulations governing the use of the District water system.

Office Hours

Monday, Wednesday, and Thursday 8 AM-4 PM; Tuesday 8 AM-7 PM, and Friday 8 AM-12 noon (by appointment).

Emergencies

The District operates on a 24-hour emergency call basis. In case of an emergency at times other than the above listed office hours, a call may be made to the Carver Police Department at 508-866-2000. Any emergency calls will be relayed to the Water District for prompt attention.

Meetings

All meetings and any changes in scheduling of the Board of Water Commissioners shall be posted by the Town Clerk at Town Hall. Schedule, date, and location shall be included in the posting. Section 23A to 23C, inclusive of Chapter 39 of the General Laws shall apply to the meetings of the Commission and Section 10 of Chapter 66 shall apply to the Commission's documentary materials or data.

Identification

All Water District employees will carry photo identification. Do not allow anyone unknown to enter your premises on Water District business unless properly identified.

Modifications

The Commissioners may change and amend the rules and regulations at any duly noticed meeting of the Water Commissioners by majority vote.

Consent

The following rules, regulations and procedures are part of the contract with every person who takes water from the North Carver Water District, and govern the relations between the Water District and its consumers and the contractors/developers who install water systems. Every such person using the District water shall be considered as having expressed consent to be bound by the rules and regulations of the District. Non-users are bound by provisions contained herein regulating the use of equipment owned by the District.

ARTICLE I—DEFINITIONS

The definitions contained in Chapter 124 of the Acts of 2008 Section 1 and any other amendments to Chapter 124 of the Acts of 2008 are hereby adopted.

Air Gap: The method of preventing backflow through the use of an unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, or other device and the flood level rim of the receptacle. The air gap separation shall be at least twice the internal diameter of the supply pipe discharge line by in no case less than one inch.

Applicant: shall mean any property owner or duly authorized owner's agent applying for water service or for a water main extension, alteration, replacement or relocation.

Apportionment Agreement: A written agreement signed and acknowledged by the owner of Benefitted Property that has been assessed a Privilege Fee, agreeing to pay the Privilege Fee over a term of years not longer than the term of years remaining for apportioned Betterment Assessments, with annual interest of five percent (5%) on the remaining balance.

Approved: Accepted by the Reviewing Authority as meeting an applicable specification stated or cited in this regulation, or as suitable for the proposed use.

Approved Backflow Prevention Device: A testable or non-testable cross connection control device that is approved by the MassDEP for use in Massachusetts.

Assessment Unit: A number that is equal to the design flow in gallons per day (gpd) based upon design flow attributed to different land uses and different types of establishments under 310 CMR 15.203 (2) through (6) of the Title 5.

Atmospheric Vacuum Breaker: A device which prevents backsiphonage by creating an atmospheric vent when there is either a negative pressure or subatmospheric pressure in a water system.

Automated Meter Reading Device: shall mean a device(s) used for reading a water meter without having to enter a premise.

Auxiliary Water Supply: Any water supply, on or available, to the premises other than the purveyor's approved public potable water supply.

Backflow: The flow of water or other liquids, mixtures or substances, under positive or reduced pressure in the distribution pipes of a potable water supply from any source other than its intended source.

Backflow Preventer: A device or means designed to prevent backflow or backsiphonage. Most commonly categorized as air gap, reduced pressure principle device, double check valve assembly, pressure vacuum breaker, atmospheric vacuum breaker, hose bib vacuum breaker, residential dual check, double check with intermediate atmospheric vent, and barometric loop.

Backpressure: A condition in which the owner's system pressure is greater than the supplier's system pressure.

Backsiphonage: The flow of water or other liquids, mixtures or substances into the distribution pipes of a potable water supply system from any source other than its intended source caused by the sudden reduction of pressure in the potable water supply system.

Barometric Loop: A fabricated piping arrangement rising at least thirty-five (35) feet at its topmost point above the highest fixture it supplies. It is utilized in water supply systems to protect against backsiphonage.

Benefited Property: A parcel of real property or contiguous parcels of real property under the same ownership within the District Service Area.

Betterment Assessment: The betterments assessed by order of the Commission on December 14, 2009, as reduced by abatement.

Boundaries: The boundaries of the North Carver Water District are on file with the Carver Town Clerk.

Building: shall mean any structure used for human occupancy, employment, recreation or other purposes.

Commission: The North Carver Water District Commission or, if the Commission shall terminate, the succeeding person, board, body or commission to whom the Commission's powers shall have been transferred by law.

Consumer or Customer: shall mean the individual, firm or corporation, or a duly authorized representative, whose name the Water District has on its books as the owner of record of the property who has applied for a water service or any individual, firm or corporation who, in fact, uses the water service of the North Carver Water District.

Containment: A method of backflow prevention which requires a reduced pressure backflow preventer or an air gap separation at the meter or property line.

Contaminant: A substance that will impair the quality of the water to a degree that it creates a serious health hazard to the public leading to poisoning or the spread of disease.

Cost per Assessment Unit: $49.25 as of November 12, 2018 increasing by the annual Consumer Price Index, or not less than 0% per year thereafter on the anniversary date of adoption of these Regulations.

Cross Connection Violation Form: A violation form designated by MassDEP, which is sent to the owner by the water supplier with copies sent to the plumbing inspectors and Board of Health delineating cross connection violations found on the owner's premises and a procedure for corrective action.

Cross Connection: shall mean any actual or potential connection between a distribution pipe of potable water supplied by the public water system and any waste pipe, soil pipe, sewer, drain or any source of contamination or pollution. Without limiting the generality of the foregoing, the term "cross connection" shall also include any bypass arrangement, jumper connection, removal section, swivel or changeover connection and any other temporary or permanent connection though which backflow can or may occur.

Double Check Valve Assembly: An assembly of two (2) independently operating spring loaded check valves with tightly closing shut off valves on each side of the check valves, plus properly located test cocks for the testing of each check valve.

Double Check Valve with Intermediate Atmospheric Vent: A devise having two (2) spring loaded check valves separated by an atmospheric vent chamber.

Department: The Massachusetts Department of Environmental Protection (MassDEP).

Design Data Sheet: A report form submitted to the supplier of water along with plans for each installation of a reduced pressure backflow preventer or double check valve assembly, or for each change to any such device already installed, describing and showing the details of the specific installation.

District: The North Carver Water District.

District Appointee: Shall mean the person appointed by the North Carver Water Commission to serve as District or to the person designated by the Commission to act in the capacity of the District.

District Service Area: The parcels of land which receive or are proposed to receive water service from the Water Project. Said land being more fully described as the "District Service Area" in Section 1 of Chapter 124 of the Acts of 2008 and on the map for the District Service Area on file with the Carver Town Clerk's office. Additional parcels may be added at the sole discretion of the Commission.

Fire Protection/Suppression System Supply Line: Shall mean the private water piping, control valve and appurtenances installed solely to furnish water for extinguishing fires. (Also referred to as a Fire Pipe in these Regulations).

Health Hazard: An actual or potential threat of contamination to the potable water in a public water system, which, in the opinion of the supplier of water would endanger health.

Hose Bibb Vacuum Breaker: A device which is permanently attached to a hose bibb and which acts as an atmospheric vacuum breaker.

Increased Flow Approval: Approval by the Commission upon review of a building permit or occupancy permit application to the Town of Carver Building Inspector, which approval allows continued use of an existing connection to the Water Distribution System for a particular number of gallons of Title 5 design flow to a Benefited Property upon which buildings or structures are to be constructed, expanded or reconstructed or changed in use for a different use of an expanded use or a more intense use than the use or intensity of use upon which the Betterment Assessment was based, or increased flow to a Benefited Property which was not liable to assessment of a Betterment Assessment or not in fact assessed a Betterment Assessment.

In-Plant Protection: The location of approved backflow prevention devices in a manner, which provides protection of the consumers of water and the potable water system within the premises.

Inspection: An on-site inspection and survey by a qualified individual to determine the existence and location of cross connections and/or the physical examination and testing of an installed backflow prevention device to verify that the backflow prevention device is functioning properly.

Inspection and Maintenance Report Form: A report form which is to be used by certified testers to record all pertinent testing information.

Main: Shall mean the piping and associated valves, hydrants and appurtenances owned by the Commission, or another town installed in a public way, publicly-owned easements whether recorded or by prescription, or private ways open to public travel, for the purpose of supplying water to one or more customers or for public fire protection including all supply or distribution pipes owned by the District.

Meter: Shall mean an instrument or device, including any appurtenances thereto, for measuring the flow of water.

Owner: Shall mean a person who alone or jointly or severally with others, has the legal title to any premises or has care, charge, custody or control of any premises as agent, executor, administrator, trustee, lessee or guardian of the estate of the holder of legal title. Also for the purposes of cross connections any person

maintaining a cross connection installation or owning or occupying premises on which cross connections can or do exist.

Owner's Agent: Any person or body designated by the owner to act as his or her representative.

Person: Any individual, corporation, company, association, trust, partnership, the Commonwealth, a municipality, district, or other subdivision or instrumentality of the United States, except that nothing herein shall be constructed to refer to or to include any American Indian tribe or the United States Secretary of the Interior in his capacity as trustee of Indian Lands.

Pollutant: A foreign substance, that if permitted to get into the public water system, will degrade its quality so as to constitute a moderate hazard, or impair the usefulness or quality of the water to a degree which does not create an actual hazard to the public health but which does adversely and unreasonably effect such water for domestic use.

Potable Water: Water from any source that has been approved by Mass DEP for human consumption.

Pressure Vacuum Breaker: A device containing one or two independently operated spring loaded check valves and an independently operated spring loaded air inlet valve located on the discharge side of the check or checks. Device includes tightly closing shut-off valves on each side of the check valves and properly located test cocks for the testing of the check valve(s).

Private Fire Protection: Shall mean private water mains, fire pipes and other appurtenances installed for the purposes of fire protection/suppression at a particular premise.

Privilege Fee: The amount to be assess by the Commission upon a Benefited Property, including properties previously assess a Betterment Assessment or not liable to assessment of a Betterment Assessment or not in fact assessed a Betterment Assessment, prior to connection of a building on the Benefited Property to the Water Distribution System or prior to obtaining an Increased Flow Approval.

Reduced Pressure Principle Backflow Preventer: An assembly consisting of two (2) independently operating approved check valves with an automatically operating differential relief valve located between the two (2) check valves, tightly closing shut-off valves on each side of the check valves plus properly located test cocks for the testing of the check valves and the relief valve.

Residential Dual Check: An assembly of two (2) spring loaded, independently operating check valves without tightly closing shut-off valves and test cocks. Generally employed immediately downstream of the water meter to act as a containment device.

Reviewing Authority: The North Carver Water District, or the Carver plumbing inspector, authorized by M.G.L. c. 142 and licensed by the Board of State Examiners of Plumbers and Gas Fitters, whichever is responsible for the review and approval of the installation of an approved backflow prevention device.

Service Pipe: Shall mean the connection, piping and associated valves and appurtenances that extend from a public water main to a building or property for the purpose of supplying water, other than for fire protection/suppression systems.

Supplier of Public Water: The North Carver Water District.

Total Amount to be Assessed as Privilege Fees: The total project cost less amounts assessed as Betterment Assessments or Privilege Fees and not abated. When the Total Amount to be Assessed as Privilege Fees has been finally assessed and not abated, the Privilege Fee shall expire.

Unapproved Source: The source or distribution system for any water or other liquid or substance which has not been approved by the Mass DEP as being of safe and sanitary quality for human consumption, including by not limited to any waste pipe, soil pipe, sewer, drain, or non-acceptable potable water system material.

Water Connection Permit: A permit issued by the Commission permitting a building or structure to be newly connected to the Water Supply and Distribution System.

Water Supply and Distribution System: The wells, pumps, treatment plant, water mains and appurtenant infrastructure supplying water to the District Service Area.

Water Project: The installation of the Water Supply and Distribution System.

ARTICLE II—GENERAL PROVISIONS

Section 1
Application for Water Service—New and Renewal: All applications for a new connection or replacement of an existing connection to the District's water system shall be made at the office of the Water District by the owner of the property, or by an authorized agent. All applications must contain the full information requested and be accompanied by the applicable fees. All new services must have frontage where there is an existing main or be approved for service by the Water District Commissioners. Refer to the Appendices for a Water Service Application.

Section 2
Responsibility of Charges: Consumers of water will be charged with and held responsible for all water passing through their service pipe until such time as they shall notify the Water District at its office in writing that they no longer desire the use of water and the District has terminated all service to the property. In the case of the sale of the property, such notice shall give the name and legal mailing address of the new owner. Failure to receive invoices and/or submit notification of transfer of ownership will not constitute a reason for any adjustment. The sale or other transfer of title of property does not eliminate the responsibility for payment of any charges or fees and the new owner of record will be held responsible for ensuring that all charges and fees are paid in full at the time of transfer or when the bills are due.

Section 3
Unusual Construction: Owners of property desiring any unusual construction, alterations or attachments connected with the water supply must submit plans and specifications for the same to the District for inspection and approval or disapproval, and for a determination as to whether the same are permissible. The District will determine the terms, charges and conditions under which their use will be allowed.

Section 4
Access to Premises: Authorized employees of the Water District upon presentation of their credentials shall be permitted access to all premises supplied with water at reasonable hours, to permit inspection of plumbing and fixtures, to set, remove, or read meters, install remote registers, survey for cross connections, to ascertain the amount of water used, the manner of use, and to enforce these procedures. When such access has been

refused, the water will be shut off. No person shall tamper with a water meter or they shall be subject to a fine, per Article II, Section 13.

Section 5
Service Turn On/Off: Only Water District employees will turn on/off a water service at the street, unless directed and/or designated by the Water District.

Section 6
Conditions Under Which Service is Furnished: The District does not guarantee constant pressure nor uninterrupted service, nor does it assure the consumer either a full volume of water or the required pressure per square inch necessary to effectively operate hydraulic elevators, or other appliances, the same being subject to all the variable conditions that occur in the water system.

Section 7
No Liability for Interruptions of Service: No consumer shall be entitled to damages, or have payment refunded, for any interruption of supply occasioned either by accident to any portion of the works, or by the stoppage or shortage of supply due to causes beyond the control of the District, such as excessive drought, excessive use of and waste of water by other consumers, or by leaks or defects in the pipes or appliances owned by him or other consumers.

Section 8
No Liability for Dirty Water: The District will not be responsible for damages caused by dirty water resulting from the opening or closing of any gate for repairs, the use of any hydrant, or the breaking of any pipe. Whenever possible or feasible, the District will notify the affected consumers by media that there may be an occurrence of dirty water. The District will also not be responsible for changes in water quality due to chlorination or if water is temporarily provided by the Town of Middleboro.

Section 9
No Liability for Consumer's Pipes: The District assumes no liability for conditions which exist in consumer's pipes and cause trouble coincident to or following the repairs of any main pipe, service pipe, meter or other appliance belonging to the Water District.

Section 10
No Liability for Collapsed Boilers, Etc.: The District reserves the right at any time, without notice to shut off the water in the mains for purposes of making repairs, extensions or for other necessary purposes. Persons having boilers or other appliances on their premises depending on the pressure in the pipes to keep them supplied with water are hereby CAUTIONED against danger from these sources, and are required to provide, at their own expense, suitable safety appliances to protect themselves against such danger. In any event, it is expressly stipulated that the Water District will not be liable for any damage resulting from water having been cut off, either through accident or necessity.

Section 11
No Liability for Shutting Off Water Without Notice: When it becomes necessary to shut off the water from any section of the District because of an accident or for the purpose of making changes or repairs, the District will endeavor to give timely notice to as many of the consumers affected thereby, as time and the character of the repairs or the accident will permit, and will, so far as practicable, use its best efforts to prevent inconvenience and damage arising from any such cause but failure to give such notice will not render the District responsible or liable for any damage that may result from shutting of the water or any coincident conditions.

Section 12

Conference with Water District: Prior to commencing installation of water works materials, the consumer will meet with the Water District to review and insure understanding of and compliance with these Rules and Regulations.

Section 13

Violations of Regulations: Any person found in violation of regulations, rules or policies shall be fined $50 (first offense) $100 (second offense), $150 (third offense). Each day shall be considered a separate violation. The District may also order the shut off to the violator's premises upon violation of these regulations. If the water has been turned off as a result of a violation of these rules, it will not be turned on again until the District is satisfied that there will not be any further cause for complaint, and charges have been paid to cover the cost of shutting off and turning on the water.

Section 14

Fire Protection: The District does not provide water for active hydrants. On a case-by-case basis, the District will approve an unmetered fire service for direct fire protection sprinkler systems. An annual charge will be applied to all unmetered fire service lines. Indirect storage for fire protection systems, if supplied, by the District must be metered. Water supplied by other sources must be completely separate from North Carver Water District public water. Only customers with an active metered domestic service will be considered for a fire protection service.

Section 15

Severability: the provisions of these Regulations are severable. If any provision of these Regulations or any specific application to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications which can be given effect in the absence of the invalid provision or application.

Section 16

Availability of Service: Subject to availability, all property situated within the North Carver Water District shall be eligible to receive water service from the Commission upon compliance with these Regulations. The timing and methods for extending or providing service shall be at the Commission's sole discretion, but construction will commence only after consultation with the Carver DPW. Eligibility for water service outside of the District shall be conditioned upon the Commission's approval and compliance with these Regulations. The Commission is not required to provide service to a property if there is an insufficient water supply in the opinion of the Commission.

Section 17

Ownership: The Commission owns all public water mains, hydrants, valves, and associated appurtenances located within public ways, Commission-owned easements, whether recorded or by prescription and private ways open to public travel within the Town unless otherwise specified in writing by the Commission (with a copy provided to the owner). The Commission also owns all water service pipes from public water mains located within public ways, Commission-owned easements, whether recorded or by prescription and private ways open to public travel within the Town to an owner's property line, except where a building, foundation wall, retaining wall, stairs, areaways or other subterranean structures are located on the property line, the Commission owns the water service pipe to a distance of 18-inches outside the property line.

Section 18

Public Water Mains: The Commission shall control the use of all public water mains in the District. No person shall, without prior written authorization from the Commission, uncover, make any connections with or opening into, alter, or disturb a public water main. No person shall maliciously, willfully or negligently break, damage,

destroy, uncover, deface or tamper with any structure, appurtenance or equipment which is part of the Commission's water distribution system.

ARTICLE III—CHARGES

Section 1
Rates and Fees: Water rates and fees shall be established and or modified by the District Commissioners.

Section 2
Date of Consumer's Liability to Pay: A minimum charge will be assessed for a water service from the date the water is turned on whether the water is used or not.

Section 3
Discounts to Prevailing Rate for Bulk Purchases: A discount from the prevailing rates, at a rate determined by the Commission, to users to fill by means of a hydrant and tanker truck.

Section 4
Payment Due Dates: Water bills are due and payable within thirty (30) days from the date of issuance.

Section 5
Overdue Bills: All water bills that are outstanding after 30-days will be mailed a demand notice which shall be due within fourteen (14) days. The demand notice shall include a demand charge and interest on the outstanding balance. Interest shall accrue at the statutory rate applicable to property taxes as stated in Massachusetts General Law, c. 59, Sec. 57. If the charges are still unpaid after the due date of the demand notice, a hand delivered shut off notice will be posted on the premises being served one week before water service is turned off or plugged. Such shut off of water charges shall be approved by the Water Commission as water rates and charges of the Water District.

Section 6
Payment Plan: Any customer, prior to the termination of service, may agree to a written payment plan with the District. Any customer requesting a payment plan to avoid shut-off shall be afforded the opportunity to participate in a payment plan provided the account is not in default of a current payment plan.

Section 7
Standard Payment Plan Offers: Any customer prior to the termination of service may agree to a written payment plan with the District. The "standard offer" provided all customers to avoid shut-off is payment of one-half the amount due, and the remaining past due balance paid on an agreed to monthly payment schedule. The first payment shall be due on the first business day of a full month following the signing of the payment plan agreement. All charges subsequent to a payment plan are independent of the payment plan and subject to collection in accordance with these Rules. Customers who fail to meet the terms of the "standard offer" and monthly payment schedule shall have their service terminated without the benefit of additional notice. Any customer on a payment plan who notifies the District in advance of a termination that the monthly payment cannot be made shall not be considered in default for that payment provided payment be made prior to the next monthly payment date. Restoration of water service to properties whose service is terminated for non-payment or default of a payment plan requires payment in full of all charges due to the District on the date of termination.

Section 8

Return Check Policy: Checks or other forms of commercial paper payable to the District for the purchase of water, materials, labor, fees, and or services to any account to which the District is entitled payment shall be subject to the provisions of MGL c. 266, s. 37. In addition, the return of any instrument of payment from the institution on which it is drawn, shall at the discretion of the District, subject the account to which it is applied to termination of service. Upon receipt of a returned instrument of payment, the District shall return said instrument to the drawer by certified mail. Included with the returned instrument of payment shall be a service termination notice. Service may be terminated on the first day after receipt of the certified mail return card or after fourteen (14) days, whichever occurs first. A service fee as described in the rate schedule, and the cost associated with the certified mail, shall be applied to the account for each occurrence an instrument of payment is returned. In addition, the return of any instrument of payment from the institution from which it is drawn shall incur on the writer of said payment a penalty fee of $25.00 or 1% of the amount of the payment if more than $2,500.00. This fee will be applied to each occurrence an instrument of payment is returned. After the second occurrence of a returned payment, payment must be made in cash, money order, or cashier's check.

Section 9

Collection of Miscellaneous Water Charges: All bills for materials on consumer's property and charges for shutting off or turning on water or other miscellaneous services will be subject to the same conditions as bills for water.

Section 10

Charge for Turning Water On or Off: A charge will be made for "turning on" or "shutting off" a water service when requested by the consumer or his agent. The Water District requires a two (2) week notice for a "turn on" or "turn off." No account will be "turned on" if there is an outstanding balance showing.

Section 11

Delinquent Accounts: No customer that owes an overdue bill for water charges shall be entitled to the further use of water at the same or any other premises until such water charges are paid in full, together with costs. Such cost shall include incurred interest as determined by the District except as provided in Section 4 and 5.

Section 12

Claims for Adjustments on Bills: All claims for adjustment of water bills shall be made in writing to the District within thirty (30) days of receipt of the bill. Such claims shall include sufficient explanation as to the basis for the claim for adjustment. If the adjustment is denied, the consumer may appeal the decision under Article VIII of these Regulations.

Section 13

All Metered Water to be Paid For: All water passing through a meter must be paid for by the consumer. The District shall not be held liable nor shall any claims be made against it in consequence for the breaking of any pipe or fixture. It is the consumer's responsibility to keep their water pipes and fixtures in good repair and protected from freezing. Consumers will be held responsible for any damage caused to the meter and water use resulting from their failure to do so. Consumers should prevent water waste at all times.

Section 14

When Meter is Out of Order: If a meter is out of order or fails to register, the consumer will be charged at the average daily consumption as shown by the meter when in order, for the corresponding period of two (2) years proceeding or as determined by the District. A notice will be delivered to the consumer in order to arrange a time for access to change the meter during normal business hours. If there is no response or the meter has not

been repaired by the next billing date, a bill for twice the prior average or as determined by the District will be sent. Service shall be terminated if arrangements for replacing the meter have not been made by the consumer within sixty (60) days of the second bill. At its sole discretion, the District may change a meter outside normal working hours at a cost determined by and adopted by the District.

Section 15
No Right to Furnish Water to Other Premises: A consumer will not be permitted to supply the premises of another person, except in special emergencies and then only with the specific written approval of the District.

Section 16
Master Metering: No master meters shall be approved, as of June 2016.

Section 17
Assessment of Privilege Fees

17.1 Prior to issuing a Water Connection Permit with respect to any Benefited Property, the Commission shall calculate the Privilege Fee due to the District based upon the Assessment Units attributed to the water flow allowed by the Water Connection Permit less the Assessment Units upon which a prior Betterment Assessment or prior Privilege Fee was based, or for Benefited Properties not previously liable to assessment of a Betterment Assessment or a Privilege Fee or not in fact assessed, for the total flow allowed by the Water Connection Permit, and shall assess such Privilege Fee.

17.2 Prior to granting Increased Flow Approval with respect to any Benefited Property, the Commission shall calculate the Privilege Fee due to the District based upon the Assessment Units attributed to the increased flow allowed by the Increased Flow Approval, less the Assessment Units upon which a prior Assessment or prior Privilege Fee was based, or for Benefited Properties not previously liable to assessment of a Betterment Assessment or a Privilege Fee or not in fact assessed, for the total flow allowed by the Increased Flow Approval, and shall assess such Privilege Fee.

17.3 After assessing any Privilege Fee, the Commission shall cause the Privilege Fee to be billed to the owner of the Benefited Property for payment within 30-days of billing. No Water Connection Permit or Increased Flow Permit shall be issued until the Privilege Fee is paid in full or an Apportionment Agreement has been signed, acknowledged, and delivered by the Benefited Property owner and recorded by the Commission.

17.4 In any Privilege Fee or apportioned amount thereof remains unpaid when the Town of Carver Board of Assessors is preparing a real estate tax list and warrant, the Commission shall certify such fee or apportioned amount to the Assessors of the Town of Carver for commitment to the Tax Collector and the Assessor shall add the fee or apportioned amount to the annual property tax assessed on the subject property. The Tax Collector, shall collect all such fees or apportioned amounts for the District as provided in G.L. c. 40, Sec. 42C and 42D and Sec. 5(a) of Ch. 124.

17.5 In the event that the Privilege Fee assessed is apportioned pursuant to this Regulation, the Commission shall record the Apportionment Agreement with the Plymouth County Registry of Deeds which is intended to provide notice of the statutory lien under G.L. c. 40, Sec. 42A and 42B to secure the payment of the apportioned Privilege Fee until paid in full.

17.6 An owner of property assessed a Privilege Fee who is aggrieved by such charge, may apply for an abatement to the Commission pursuant to G.L. C. 40, Sec. 42E.

ARTICLE IV—METERS

Section 1
Meter Installation: A shut-off valve at the meter inlet shall be the first fitting inside serviced building and shall be approved by the District. An approved valve shall also be installed near the outlet of the meter by the consumer, at the consumer's expense, to permit removal of the meter without back flow from the internal piping system.

Section 2
Consumers to Pay for Meter and Meter Repairs: All repairs or damages to meters from freezing, hot water or external causes shall be the responsibility of and paid for by the consumer. Per Appendix C "Meter Set-Up" all meters shall be supplied by the District and shall be subject to a 15% markup fee for time and materials.

Section 3
Meter Size: The proper size, type, and kind of water meter required for any given service shall be approved by the Water District. Per Appendix C "Meter Set-Up" all meters shall be sized and supplied by the District.

Section 4
Meter Not to be Removed: All meters up to and including 2" in size shall be set by an employee or contractor designated by the Water District, and shall not be moved or disturbed except by the same, unless otherwise directed and/or designated by the Water District. Larger meters shall be installed and maintained by the consumer or designee under the District's supervision.

Section 5
Ownership of Meters: All meters shall be owned by the District. Consumers are prohibited from tampering with, damaging or otherwise interfering with the operation of water meters. Any meter seal found broken may be considered a violation of this rule.

Section 6
Meter Pits: Any property with a distance of 100-feet or over from the building to the property line, will require a meter pit as well as buildings with no cellar or with a crawl space. A service to a property that does not have frontage on a road with a water main must also have a meter pit. Meter pits to be installed at the owner's expense and shall be according to plans approved by the District.

Section 7

North Carver Water District's Right to Change Meters: If, in the opinion of the Water District, a meter does not fit the conditions of the service installation, the District has the right to change such meter. Such change shall be made in accordance with current regulations at the expense of the consumer. Per Appendix C "Meter Set-Up" all meters shall be supplied by the District and shall be subject to a 15% markup fee for time and materials.

Section 8
Double Check Valve: An approved backflow prevention device (double check valve) shall be installed on each service line to a consumer's water system immediately after the meter (consumer's side of the meter) and before the first branch line leading off the service line. Note: Service lines to buildings other than for residential use may require another type of backflow prevention device; see Article VI-Section 1: Cross Connections.)

Section 9
Auxiliary Meters: Where the supply of water through a service is by a single meter, the District will read and maintain this meter. If additional or auxiliary meters are wanted by the consumer for showing subdivisions of such supply, they may be furnished and installed through the District, at the expense of the consumer, who must assume all responsibility of reading and maintaining the same.

Section 10
Repairing Meters: The Water District will have the right to remove, repair, test, or replace any meter as determined by the District. All meter installations on services that cannot be shut off for meter repairs shall be equipped with a metered by-pass at the expense of the consumer.

Section 11
Access to Meter: It shall be the duty of all consumers to see that meters and/or meter reading boxes on service connections, wherever located, shall be readily accessible to the Water District. If within 3 days after notification from the Water District, an obstruction fails to be removed, water may be shut off to the premises. Water will not be turned on until all obstructions are removed, all regulations complied with, and all expenses for shutting off and turning on the water are paid.

Section 12
Testing Small Meters by Request: The Water District will test the accuracy of water meter. Meters up to and including 1" may be tested by the Water District or an authorized representative upon written request of the consumer, who shall pay a fee to cover the cost of the test. If the meter is found to register over 2% more water than actually passes through it, the meter will be repaired or replaced and the fee refunded. The water bill for the current period will be adjusted in accordance with the result of the test. If, however, the testing shows the water meter under-registering by more than 5% the consumer may be charged for unbilled usage for no more than 90-days at the under-registered percentage for the actual metered use.

Section 13
Metering: All water must be metered. In cases where fire service lines are permitted by the District for sprinkler systems, an unmetered service may be installed. The users of the bulk water fill station shall use a single meter and certify their usage on a running log sheet.

ARTICLE V—SERVICE, PIPE & FIXTURES

Section 1
Water Waste: Consumers must keep their water pipes and fixtures in good repair and protected from frost at their own expense. They shall be held responsible for any damage resulting from their failure to do so. They shall prevent waste of water.
Section 2
All Services to be Inspected: All new or replaced service pipes must be inspected by the Water District or its designee before covering the trench. All pipes and trenches shall meet the approval of the Water District.

Section 3
Service Connection Fees: All service connections are subject to a Water District system fee. This fee shall be paid before any connections to the distribution system are allowed. An approved licensed utility contractor must install all connections. Installation costs are the responsibility of the consumer or the developer.

Section 4

Responsibility for Service Pipes: The service pipe from the water main to property line shall be owned and maintained by the Water District. With the exception of the water meter, the service pipe and all appurtenances from the property to the consumer's property shall be owned by and is the responsibility of the consumer. In the event of a leak in the consumer's service, such leak will be repaired upon discovery. Failure to make repairs within 7-days of discovery on non-emergency situations may result in termination of water service. The District reserves the right to terminate water service immediately in emergency situations. The consumer has the option of having the water service line repaired by the Water District or a private. If the Water District repairs the service line, all time and materials are subject to a 15% markup fee. All repair costs associated with water service pipes on the consumer's property are at the expense of the consumer and the Water District must approve all materials used.

Section 5

Leaks: A consumer may be billed for the estimated leakage if repairs are not made within a reasonable time.

Section 6

Temporary Service: Temporary services will be at the expense of the consumer and water passing through the service will be metered subject to a temporary meter fee. Refer to fee schedule.

Section 7

One Service to Each Premise: Only one service connection will be made to each dwelling unit located in a building or to each commercial or industrial building unit. Exceptions shall only be allowed in cases where both a dedicated fire service line and a domestic service line are anticipated.

Section 8

Request for Turning On or Shutting Off Water: Requests for "turning on" or "shutting off" a water service for repairs shall be made at least one business day in advance except in the case of an emergency. A charge will be assessed accordingly for each such service. Only Water District personnel or authorized representatives shall "turn on" or "shut off" the water service valve at the street. Requests for turning on or shutting off water, other than at normal business hours, shall be billed at overtime rates. Refer to Appendices: Request for Turning on or Shutting off Water.

Section 9

Special Reads for Transfers: A meter reading request for a transfer of ownership must be received by the Water District at least one week prior to the real estate closing. The Water District if given ample notice will read and produce a final water invoice prorating the charges to the date of the closing. If the property sale fails to take place the District should be notified immediately to prevent administrative charges to the consumer

Section 10

Extensions: Installation of services beyond the end of an existing water main will not be allowed. The main must be extended (including necessary hydrant and appurtenances) to the furthest limit of the applicant's property, unless specifically waived by the District. Water mains shall be "looped" when required by the District.

Section 11

Frozen Service Connection: When a consumer's service connection is frozen, the thawing is the responsibility of the consumer.

Section 12

Service Pipe Trenches: Service pipes shall be located as follows: not within 5-feet of the gas line; not within 10-feet of any part of a septic system's leaching pit, field, or septic tank pursuant to 31 CMR 15.211.

Section 13
Private Fire Services: Subject to the provisions of Article VI, Section 15. Private fire sprinkler service pipes may be installed at the expense of the consumer with the prior written approval of the District. The layout of check valves, type and size of pipe control valves, and meter shall be subject to the review and approval of the Water District and the Fire Chief or his designee. A backflow device shall be installed on all fire service lines. No service line or tap is to be taken from any private fire sprinkler service line. Failure to comply with this regulation will be just cause to discontinue the water service and the consumer will be charged for the water used as estimated by the Water District. No water is permitted through fire connections except for extinguishing of fires or pre-approved testing of the firefighting equipment. The backflow devices on private fire service shall be tested annually by the District at fees established by the District.

Section 14
Use of Fire Hydrants: The use of fire hydrants is restricted to the North Carver Water District and the Town of Carver. Any unauthorized use of hydrants may be subject to a fine and charges for the estimated use of water, whether used or wasted.

Section 15
Obstructing Fire Hydrants: No person shall obstruct the access to any fire hydrant by placing or permitting any debris, building material or other obstruction to remain on or about the hydrant, which will in any manner interfere with its immediate use or visibility.

Section 16
Use of Gate Valves: District personnel must perform the operation of all gate valves unless otherwise authorized by the District. Opening or closing of the valves by unauthorized parties shall constitute a fine and will be charged for the estimated use of water, whether used or wasted.

Section 17
Construction: Construction of all water appurtenances must be in accordance with the District's construction specifications and/or must be approved by the District.

Section 18
Lawn/Landscape Irrigation Systems: Owners with existing sprinkler systems, as well as newly installed lawn/landscape irrigation systems are required to install and maintain rain shut-off devices and or soil moisture monitoring devices on their lawn/landscape irrigation systems. Any owner with an automatic lawn/landscape irrigation system found watering in the rain will receive a written warning for the first offense, be fined $300 for the second offense and be fined $500 for the third offense. At the time of the third offense the water will be shut off and water service will not be restored until all fines have been paid and a working rain shut-off device and/or soil moisture monitoring device is inspected by District personnel. All future connections to the North Carver Water District system whether residential, commercial, industrial or municipal will be restricted from connecting automatic in-ground sprinkler systems to the District supply. Customers that have applied for service after the adoption of the rules and regulations that are found to have connected outside irrigation to the district supply are subject to immediate termination of their entire water service. Water will not be restored until a fine of $100 is paid and the irrigation is disconnected.

ARTICLE VI—NORTH CARVER WATER DISTRICT CROSS-CONNECTION CONTROL PROGRAM

I. Purpose

A. To protect the public potable water supply served by the North Carver Water District from the possibility of contamination or pollution by isolating such contaminates or pollutants which could backflow or back-siphon into the public water system.
B. To promote the elimination or control of existing cross connections, actual or potential, between its customers in-plant potable water system, and non-potable systems.
C. To provide for the maintenance of a continuing program of cross connection control which will effectively prevent the contamination or pollution of all potable water systems by cross connection.

II. Authority

The Town of Carver North Carver Water Commission is invested with the authority and responsibility for the implementation of a cross connection control program and for the enforcement of the provision of the Ordinance.

As provided for in the Federal Safe Drinking Water Act of 1974, (Public Law 93-523), and the Commonwealth of Massachusetts Drinking Water Regulations, 310 CMR 22.22, the water purveyor has the primary responsibility for preventing water from unapproved sources, or any other substances, from entering the public potable water system.

A. North Carver Water District, Rules and Regulations, adopted June 30, 2010.
B. Chapter 124 of the Acts of 2008, as amended.

III. Responsibility

The Water Commission shall be responsible for the protection of the public potable water distribution system from contamination or pollution due to the backflow or back-siphonage of contaminants or pollutants. If, as a result of a survey of the premises, the Commission determines that an approved backflow prevention device is required at the North Carver Water District's water service connection or as in-plant protection on any customer's premises, the Commission, or its delegated agent, shall issue a cross connection violation form to said customer to install approved backflow prevention devices. The customer shall, within a time frame determined by the North Carver Water Commission, install such approved device or devices at his own expense, and failure or refusal or inability on the part of the customer to install said device or devices within the specified time frame shall constitute a ground for discontinuing water service to the premises until such device or devices have been properly installed.

IV. Definitions

A. Refer to Article I.

V. Administration

A. The North Carver Water Commission will operate an active cross-connection control program, to include the keeping of necessary records, which fulfills the requirements of Mass DEP's Cross Connection Regulations and is approved by Mass DEP.
B. The Owner shall allow his property to be inspected for possible cross-connection and shall follow the provisions of the North Carver Water Commission's program and Mass DEP's Regulations.

VI. Requirements

A. Commission.

1. On new installations, the North Carver Water Commission will provide onsite evaluation and/or inspection of plans in order to determine the type of backflow preventer, if any, that will be required, will issue permit, and perform inspection and testing.
2. For premises existing prior to the start of this program, the North Carver Water Commission will perform surveys of the premises and review of as-built plans and issue a cross connection violation form to the owner detailing any corrective action required, the method of achieving the correction, ant he time allowed for the correction to be made. The time period allowed shall depend on the degree of hazard involved.
3. The North Carver Water Commission will not allow any cross-connection to remain unless it is protected by an approved backflow preventer for which a permit has been issued and which will be regularly tested to insure satisfactory operation.
4. The North Carver Water Commission shall inform the Owner by letter, of any failure to comply, by the time of the first re-inspection. The North Carver Water Commission will allow an additional fifteen (15) days for the correction. In the event the Owner fails to comply with the necessary correction by the time of the second re-inspection, the North Carver Water Commission will inform the Owner by letter, that the water service to the Owner's premises will be terminated within a period not to exceed five (5) days. In the event that the Owner informs the North Carver Water Commission of extenuating circumstances as to why the correction has not been made, a time extension may be granted by the North Carver Water Commission but in no case will exceed an additional thirty (30) days.
5. If the North Carver Water Commission determines at any time that a serious threat to the public health exists, the water service will be terminated immediately.
6. The North Carver Water Commission will begin initial premise inspections to determine the nature of existing or potential hazards, following the approval of this program by Mass DEP, during the calendar year 2011. Initial focus will be on high hazard industries and commercial premises.

B. Owner

1. The Owner shall be responsible for the elimination or protection of all cross-connections on his premises.
2. The Owner shall be responsible for applying for and obtaining all necessary approvals and permits for the maintenance of cross connections and installation of backflow prevention devices.
3. The Owner shall correct any malfunction of the backflow preventer which is revealed by periodic testing.
4. The Owner shall inform the North Carver Water Commission of any proposed or modified cross connections and also any existing cross connections of which the Owner is aware but has not been found by the North Carver Water Commission.
5. The Owner shall not install a bypass around any backflow preventer unless there is a backflow preventer of the same type on the bypass. Owners who cannot shut down operation for testing of the device(s) must supply additional devices as necessary to allow testing.
6. The Owner shall install backflow preventers in a manner approved by the North Carver Water Commission.
7. The Owner shall install only backflow preventers approved by Mass DEP.

8. Any Owner of industrial, commercial, or institutional premises having a private well or other private water source must have a permit if the well or source is cross connected to the North Carver Water Commission System. Permission to cross connect may be denied by the North Carver Water Commission. The Owner may be required to install a backflow preventer at the service entrance if a private water source is maintained even if it is not cross connected to the North Carver Water System.
9. The Owner of a private well or individual water source serving residential dwellings used for potable or non-potable purposes will not be allowed a physical connection with the North Carver Water System.
10. The Owner shall be responsible for the payment of all fees for permits, annual or semi-annual device testing, retesting in the case that the device fails to operate correctly, and second re-inspections for non-compliance with Mass DEP or North Carver Water Commission requirements.

VII. Degree of Hazard

The North Carver Water Commission recognizes the threat to the public water system arising from cross-connections. All threats will be classified by degree of hazard and will require the installation of approved reduced pressure principle backflow prevention devices or double check valves. The North Carver Water Commission may require a containment device on the water service entrance to any customer who, as a result of unprotected cross connections, could contaminate the North Carver Water System.

VIII. Existing In-Use Backflow Prevention Devices

Any existing backflow preventer shall be allowed by the North Carver Water Commission to continue in service unless the degree of hazard is such as to supersede the effectiveness of the present backflow preventer or result in an unreasonable risk to the public health. Where the degree of hazard has increased, as in the case of a residential installation converting to a business establishment, any existing backflow preventer must be upgraded to a reduced pressure backflow preventer, or a reduced pressure backflow preventer must be installed in the event that no backflow device was present.

IX. Periodic Testing

A. Reduced pressure principle backflow devices shall be tested and inspected at least semi-annually.
B. Backflow device testing and inspection shall be performed by Mass DEP certified backflow tester.
C. The testing shall be conducted during the North Carver Water Commission's regular business hours. Exceptions to this, when at the request of the Owner, may require additional charges to cover the increased costs to the North Carver Water Commission.
D. Any backflow preventer which fails during a periodic test must be repaired or replaced by a licensed plumber. When repairs are necessary, upon completion of the repair, the device will be retested at the Owner's expense to insure proper operation. High hazard situations will not be allowed to continue unprotected if the backflow preventer fails the test and cannot be repaired immediately. In other situations, a compliance date of not more than fourteen (14) days after the test date will be established. The Owner is responsible for spare parts, repair tools, or a replacement device. Parallel installation of two devices is an effective means of the Owner ensuring that uninterrupted water service remains during testing or repair of devices and is strongly recommended when the owner desires such continuity.

E. Backflow prevention devices will be tested more frequently than specified above in "A" in cases where there is a history of test failures and the North Carver Water Commission feels that due to the degree of hazard involved, additional testing is warranted. Cost of the additional tests will be borne by the Owner.

X. Reports and Records

A. Records

The North Carver Water Commission will initiate and maintain the following:

1. Master files on customer cross-connection tests and/or inspections.
2. Master files on approved cross-connection installations.
3. Master files on facilities surveyed and violations found.
4. Master files on correspondences, violation notices and enforcement actions.

B. Reports

The North Carver Water Commission will submit reports, such as: listing of cross connection and respective devices, summary of cross connection inspections and surveys, to the Mass DEP upon request.

XI. Fees and Charges

Fees shall be set forth in North Carver Water District Fee Schedule.

XII. Miscellaneous

A. Residential dual check

All new residential buildings will be required to install a residential dual check device immediately downstream of the water meter. Installation of this residential dual check device on a retrofit basis on existing service lines will be instituted at a time and at a potential cost to the homeowner as deemed necessary by the North Carver Water Commission.

The Owner must be aware that installation of a residential dual check valve results in a potential closed plumbing system within his/her residence. As such, provisions may have to be made by the owner to provide for thermal expansion within his/her closed loop system, i.e. the installation of thermal expansion devices and/or pressure relief valves.

B. Strainers

The North Carver Water Commission strongly recommends that all new retrofit installations of reduced pressure principle devices and double check valve backflow preventers include the installation of strainers located immediately upstream of the backflow device. The installation of strainers will preclude the fouling of backflow devices due to both foreseen and unforeseen circumstances occurring to the North Carver Water system. System occurances such as water main repairs, water main breaks, fires, periodic cleaning and flushing of mains, etc. These occurrences may "stir up" debris within the water main that will cause fouling of backflow devices installed without the benefit of strainers.

C. Treatment

No treatment shall be added to water supplied by the Town unless authorized by the District.

D. Auxiliary Tankers

All tanker trucks must be filled at District approved sites to eliminate potential cross connections. This section shall not apply to Town of Carver or Mutual Aid fire trucks. Refer to the North Carver Water Commission Fee Schedule.

XIII. Appendix

A. Inspection and Maintenance Report Form.
B. Standard Letters

VIOLATION NOTICE

(Date)
(Facility Owner Name)
(Facility Address)
(City/Town, State ZIP)

Re: Cross Connection Control Survey Violation Notice

Dear **(Facility Owner Name):**

THIS IS AN IMPORTANT NOTICE, FAILURE TO TAKE ADEQUATE ACTION IN RESPONSE TO THIS NOTICE COULD RESULT IN SERIOUS LEGAL CONSEQUENCES.

On **(survey date)**, inspector **(Inspector's Name)** of the North Carver Water District Cross-Connection Control Program conducted a survey of your property located at **(facility address)**. 310 CMR 22.22, Massachusetts Drinking Water Regulations requires all industrial, commercial and institutional facilities to be surveyed for cross-connection. This cross-connection survey was performed to determine if any cross-connection between the drinking water distribution system and any non-potable liquid or gasses exists. **(Owner's representative)** was present during the survey.

310 CMR 22.22 defines a cross-connection as "...any actual connection or arrangement between any pipe conveying potable water from a public water system and any non-potable water supply, piping arrangement or equipment including, but not limited to waste pipe, sewer, drain, other unapproved sources, or any direct or indirect connection between a plumbing fixture or device whereby contaminated water or fluids, gases, or substances may enter and flow back into the potable water piping system or the distribution system of a public water system."

The following cross-connection(s) was/were found during the cross-connection survey. **(Describe in detail the cross-connection(s) found and the exact location.)**

These cross-connections are in violation of 310 CMR 22.22 and must be eliminated or properly protected by **(date).**

You are required to submit a plumbing plan or design data sheet detailing the correction for each of the cross connections found. This information must be submitted to the North Carver Water District for review and approval.

Please note the North Carver Water District Cross-Connection Control Program recommends the elimination of the cross connection whenever possible. In many cases, re-piping some portion of your facility may eliminate or reduce the number of backflow preventers needed which could result in significant cost savings to you and additional protection of the water supply for all consumers of the system. We encourage you to discuss this option with your plumber.

In situations of economic hardship, time extension may be granted. In order for an extension to be considered, a request must be made to the North Carver Water District Cross-Connection Control Program in writing, indicating the reasons for the extension and the proposed schedule for elimination or protection of the cross-

connection. This must be submitted with the plumbing plan or design data sheet according to the previously mentioned time frame.

North Carver Water District, does not, under any circumstances, recommend or endorse any person, agent, company, contractor, etc., to engage in the correction of the violation(s) contained within this violation notification. However, this violation notification is considered to be a public record and may be obtained by any interested parties under the guidelines set forth in the Massachusetts Public Records Law.

If further information is necessary, please contact the North Carver Water District Cross Connection Control Program at:

C/O NCWD
108 Main Street
Carver, MA 02330

508-866-3400

Please be advised, if you feel that any or all of the above mentioned violations are incorrect, please submit a written statement listing the violation(s) that you feel are in error and your facility will be re-evaluated. In addition, the North Carver Water District does have a formal appeal process. For more information, please contact the Town of Carver DPW at 508-866-3400

Thank you for your cooperation in protecting North Carver Water District drinking water.

Sincerely,

Cross Control Inspector

Enclosures

CC: Carver Plumbing Inspector
Carver Building Commissioner
Chairman, Board of Health
Carver Fire Chief

ARTICLE VII—WATER USE RESTRICTIONS

Section 1

Declaration of a State of Water Supply Conservation: The District Commissioners may declare a State of Water Supply Conservation upon a determination by a majority vote of the Commission that a shortage of water exists and conservation measures are appropriate to ensure an adequate supply of water to all water consumers. Public notice of a State of Water Conservation shall be made as provided herein before it may be enforced.

Section 2

Restricted Water Uses: A declaration of a State of Water Supply Conservation shall include one or more of the following restrictions, conditions, or requirements limiting the use of water as necessary to protect the water supply. The applicable restrictions, conditions or requirements shall be included in the public notice.

- Odd/Even Day Outdoor Watering: Outdoor watering by water users with odd numbered addresses is restricted to odd numbered days. Outdoor watering by water users with even numbered addresses is restricted to even numbered days.
- Outdoor Watering Ban: Outdoor watering is prohibited.
- Outdoor Watering Hours: Outdoor watering is permitted only during daily periods of low demand, to be specified in the declaration of a State of Water Supply Conservation and public notice thereof.
- Filling Swimming Pools: Filling of swimming pools is prohibited.
- Automatic Sprinkler Use: The use of automatic sprinkler systems is prohibited.

Section 3

Public Notification of a State of Water Supply Conservation& Notification to DEP: Notification of any provision, restriction, requirement or condition imposed by the District as part of a State of Water Supply Conservation shall be published in a newspaper of general circulation within the Town, or by such other means reasonably calculated to reach and inform all users of water of the State of Water Supply Conservation. Any restriction imposed under Section 2 shall not be effective until such notification is provided. Notification of the State of Water Supply Conservation shall also be simultaneously provide to the Mass DEP.

Section 4

Termination of a State of Water Supply Conservation Notice: A State of Water Supply Conservation may be terminated by a majority vote of the District Commissioners, upon a determination that the water supply shortage no longer exists. Public notification of the termination of a State of Water Supply Conservation shall be given in the same manner as Section 3.

Section 5

State of Water Supply Emergency & Compliance with DEP orders: Upon notification to the public that a declaration of a State of Water Supply Emergency has been issued by the District of Environmental Protection, no person shall violate any provisions, restriction, requirement, condition of any order approved or issued by the District intended to bring about an end to the State of Emergency.

Section 6

Penalties: Any person violating this bylaw shall be liable to the District in amount of $50.00 for the first violation and $100.00 for each subsequent violation, which shall inure to the District. Fines shall be recovered by indictment, or on complaint before the District Court, or by non-criminal disposition in accordance with Section 21D of Chapter 40 of the General Laws. Each day of violation shall constitute a separate offense.

ARTICLE VIII—APPEAL PROCEDURES

Section 1
Appeals from shut-offs or terminations or fines affected under these Regulations shall be governed by the Commission.

Section 2
Informal Conference: Whenever the Commission, acting under these Regulations, denies an application; requires a consumer or user to take action in accordance with these regulations; issues a cease and desist order, a compliance order, or an implementation schedule; or assesses penalties or other charges for noncompliance, the Commission shall inform the consumer to whom such action is addressed.

Such notice shall be sent by first-class mail and shall inform the addressee of his right to submit, within 21-days after the date of such notice, a written request for reconsideration of the Commission's action. A request for reconsideration shall be addressed to the District at the Commission's main office and shall set forth in detail the facts supporting it. Upon receiving such a timely request for reconsideration, the District (or designee) shall schedule an informal conference with the consumer making the request. Written notice of the conference date, time and place shall be mailed to that consumer at least 10-days before the date of the conference. The District (or designee) shall rule in writing on the request for reconsideration within 21-days after completion of the conference. A copy of the ruling on the request for reconsideration shall be mailed to the consumer who submitted the request and shall notify the owner or user of the right to request a hearing before the Commission or its designated representative.

Section 3
Hearings: A hearing before the Commission or designated representative must be requested in writing within 30-days of the decision on the request for reconsideration. A request for a hearing before the Commission or designated representative shall be in writing and shall be addressed to the Commission at the Commission's main office and shall set forth in detail the facts supporting such request. The Commission shall schedule a hearing and shall mail to the consumer who requested the hearing a written notice specifying the date, time and place of the hearing. The decision of the Commission shall be final.

Appendix A

GUIDELINES AND SPECIFICATIONS FOR WATER SERVICES AND MAINS IN THE NORTH CARVER WATER DISTRICT

Note: all references to Water District/District shall include, or authorized designee

A. Application for Water Service
   1. Obtain and submit application at the Water District office located at 108 Main Street, Carver, MA 02330.
   2. Obtain DIGSAFE permit number—both for public and private property. Present plan or print of proposed project (DIGSAFE: 888-344-7233).
   3. Obtain Street Opening Permit at Carver DPW located at 108 Main Street, Carver, MA 02330; (requires either bonded contractor, or ability to obtain a bond).
   4. Obtain application to access State Highway from MA-DOT, if applicable.
   5. Arrangements for installation are to be made a minimum of 72-hours prior to installation with Water District. No installation will be allowed without water personnel on site, inspection shall be as per Article V, Section 2. No permits to open public ways between November 15 and April 15, except in such cases deemed to be emergencies. Applications must be received by November 1.
   6. Obtain Trench Safety Permit for any excavation defined as a trench in 520 CMR 14:00 from the Carver DPW.
   7. Obtain Water Connection Permit with Increased Flow Approval, if applicable.

B. Actual Installation
   1. Proper safety devices and warning signs will be set up prior to any excavation. This includes cones, horses, etc. A police officer will be required if the District or other authorized official deems an officer to be necessary.
   2. No pavement will be cut without a Carver DPW Street Opening Permit.
   3. Any excavation work requiring pavement removal will be cut by an accepted method, such as the use of a jack-hammer, cutting wheel, or cutting saw. No asphalt shall be removed without being properly cut first. Paved area must be replaced with material approved by the DPW.
      a. If the water main is located across the street from the desired location, the contractor or builder will be required to try and wash, push, or drive the pipe under the street. If a mechanical device is used, such as a mole, the device will be driven from the water main side to the opposite excavation.
   4. Proper excavation and safety procedures will be followed regarding trenching for pipe installation. Applicable State and Federal regulations apply.
   5. Any material excavated from the trench, which is deemed unsuitable by the Water District or DPW, will be removed and replaced with material approved by the DPW.
   6. Proper back filling procedures will be used in refilling the trenches, both to ensure proper protection of the pipeline and for the compaction of the trench. Care will be taken to protect existing utilities, and any damage to existing facilities will be paid for by party responsible.
   7. All water services, domestic, commercial, industrial or institutional shall be installed in a straight line between the water main and the dwelling/building to be served. Any variations presented by on-site conditions shall be at the discretion of the Water District. Such conditions include driveways, on-site septic design, or natural geology, i.e. Ledge, boulders, etc.
   8. All pipe and fittings will be to Water District specifications and to AWWA specifications for water systems. No piping will be buried without inspection per Article V, Section 2. Any piping buried

without inspection will not be acceptable to the Water District and will have to be uncovered for inspection.

9. All service connections will have compression type connections unless otherwise approved. Compression type connections will be required on all joints where the pipe is jointed to the fitting. Mueller cc thread is required on all taps two (2) inches or less. Pipe threads will be required on all other fittings being adapted to compression fittings or to meter connections. Ball valves are required in the cellar before the meter (cellar valves). Pressure reducers may be required after the meter (see Plumbing Inspector). All water service pipes will be CTS-PE tubing from main to building. All pipes will meet AWWA specifications for water service piping. Only stainless steel inserts will be allowed. The approved contractor will provide all materials from the building to the water main (including tubing, adapters, corporation, curb stop and box).
10. All installations including tapping of water mains shall be performed only by authorized contractors who are listed and approved by the District. All costs of the service installation including required system fees and inspection fees will be at the expense of the customer, contractor, or builder.
11. Charges for services rendered will include all materials and labor supplied by the Water District, including the meter and connections plus appropriate overhead charges, and billed to the owner.
12. All subdivisions, condominium projects, and multiple housing or other types of projects will supply everything needed to provide adequate domestic water supply and to meet the fire protection requirements to said projects. They will apply to the Board of Water Commissioners for a water connection permit. A complete set of plans (engineering the project) must be submitted to and approved by the Water District.
13. Water System plans will include the layout of the water main, complete with all hydrants, valves, service connections, and other details necessary to construct the water main. A locus map showing the location of the project. A construction detail plan showing hydrant details (side view and top view); pipe laying and trench details; details for fitting and thrust blocks and any other detail the Water District deems necessary. A complete set of technical specification details will be printed on the plans, so as there is no question in the field concerning requirements. The Water District reserves the right to require additional details and make changes to any plan which the District feels necessary. Knowing that all plans do not account for field changes, the Water District reserves the right to approve any changes necessary because of field conditions. As-built plans shall accurately reflect the installation of the water main. As-built plans shall be prepared and stamped by a professional engineer or land surveyor in accordance with the requirements of the District or its designee.
14. The service pipe in a public way must be installed by the Town, the District, or a private contractor. All fees to be paid by the applicant. This shall be at the discretion of the Water District. Any service line installed by a private contractor in a public way must be guaranteed for one (1) year from date of acceptance.
15. All work, including labor, equipment, and materials, performed by DPW personnel in a public way will be billed to the applicant at the going rates of the DPW. Water District personnel shall inspect all water installations before any back filling will be allowed (both on public and private property).

C. Cancelling of Scheduled Installations
   1. If all necessary paperwork is not completed by date of installation including street opening.
   2. If any charges owed to the Town of Carver or the District are outstanding.
   3. If safety equipment is not on site as required.
   4. If proper equipment to do the job is not on site (jack-hammer, compressor, etc.)
   5. If inclement weather conditions prevail.

D. These specifications and guidelines have been established to assist the Town or District control projects and to assist project engineers, contractors, developers and builders in what is required for water services and water main installations. They are not meant to supersede street opening permits, plumbing code regulations or water regulations established by EPA or the State of Massachusetts regulations that supersede local regulations.

E. No water will be turned on unless:
   1. Any and all construction bills owed to the Town of Carver or the District are paid in full.
   2. All necessary permits are issued, inspections are complete, and fees are paid.

F. No other source of water supply (either potable or non-potable) will be allowed to be attached to any plumbing system served by the public water supply.

Appendix B

NORTH CARVER WATER DISTRICT LICENSED CONTRACTOR REQUIREMENT

Only contractor's licensed and listed as approved by the North Carver Water District shall be permitted to lay and or repair water services in the North Carver Water District. Contractors are required to know, and are bound by all North Carver Water District Rules, Regulations, and Fees in force at the time of the work.

Licenses to install or repair water services will only be issued to experienced and competent contractors. Licenses may be issued to either individuals or companies. Licenses are not transferable.

Contractors may obtain an initial or renewal license to install or repair water services at any time during the calendar year. All licenses shall expire on December 31st of each year.

Contractors that have not worked in North Carver Water District for two years prior to the adoption of this section, shall be required to provide with their initial license application two letters from other water departments verifying their experience and competency to lay or repair water services. Said letters shall be sent directly to the North Carver Water District from the issuing water department.

Contractors doing work under this section shall maintain insurance coverage as follows:

- Public Liability $3,000,000.00
- Property Damage Liability $3,000,000.00

Such coverage shall be in force for the calendar year, and name the North Carver Water District as an additional insured party. Coverage shall include a rider for Explosion, Collapse and Underground. A copy of the insurance binder will be provided to the North Carver Water District at the time of application.

Contractors doing work under this section shall also have in force all applicable Workmen's Compensation, motor vehicle, and other insurances as required by the Laws of the Commonwealth of Massachusetts.

The North Carver Water District reserves the authority to revoke the license of any contractor if, in the opinion of the North Carver Water District, their construction methods or materials do not comply with the North Carver Water District Rules, Regulations, and Fees in force at the time of the work.

Owners of the property to which water is provided are liable and responsible for all work and warranties provided by the contractor. The North Carver Water District provides no warranty either explicit or implied, as to the quality of workmanship and materials provided by licensed contractors.

Issuance of a license to a contractor in the employ of a water taker or property owner shall indemnify the North Carver Water District, its employees and elected officials against any and all claims, liability or action for damages, incurred in, or in any way connected with the performance of the work of the licensee, and for or by reason of any acts or omissions of said licensee in the performance of their work.

Appendix C
TECHNICAL SPECIFICATIONS NORTH CARVER WATER DISTRICT

SERVICES

Potable water services shall be either one (1) or two (2) inch tap. Requests for larger service connections must be pre-approved by the Water Commissioners. All service connections shall be compression type fittings with stainless steel inserts; flared fittings are not permitted. All materials must be installed as to have no leakage under pressure. Water services shall be sized in accordance with AWWA M-22.

Service blow-off saddles shall be nylon coated iron with double stainless steel straps. Service saddle shall be equivalent to Model 317 Service Saddles as manufactured by Smith-Blair or equivalent for ductile iron pipe.

WATER SERVICE TUBING

Polyethylene (PE) tubing for service connections shall be HDPE tubing with classification SDR 9. Copper tube size (CTS) PE tubing shall conform to AWWA C-901 requirements.

CORPORATION STOPS

The corporation stops shall meet the most recent revision of the AWWA standard "Threads for Underground Service Line Fittings" AWWA C800. Corporation stops and fittings shall be brass conforming to the requirements of AWWA C-800. Corporation stops shall be designed for 300 psi test pressure as manufactured by Mueller, Inc. Corporation stops shall be Mueller Ori-Corp ® H-15008 with compression connections outlets.

CURB STOP

Curb stops shall meet the most recent revisions of the AWWA standard "Threads for Underground Service Line Fittings" AWWA C800. Curb stops shall be designed for 300psi test pressure as manufactured by Mueller, Inc. Curb stops shall be Mueller Mark II Triseal H-15219 with compression connections.

CURB BOX

All water service boxes shall be North American made "Buffalo" style 2 ½-inch to include cover, slide top and base. The curb box shall measure the length from the curb to the finish grade plus 6-inches. All curb stops shall be centered and plumb in the box at a depth no greater than 6-feet below final grade. Depths greater than 6-feet require an "Erie" style extension rod attached to the curb stop. The valve boxes shall be so designed and constructed as to prevent the direct transmission of traffic loads to the pipe or curb stop. Service boxes shall be coated both inside and outside with coal tar pitch.

METER SET-UP

The property owner shall provide a suitable location for the installation of the meter. Said location shall be approved by the Water Commission and shall be such as to prevent freezing of the meter. Losses incurred due to freezing shall be fully recoverable by the North Carver Water District. Customers shall pay for meter in accordance with the rate schedule at the time of service application. All meters shall be supplied and owned by the North Carver Water District and register in cubic feet. All services shall be fitted with a 5/8-inch Schlumberger/Neptune remote reader meter. Requests for larger meters will be considered if documented by a

fixture analysis per CMR 2.14(3) and AWA M-22. All meter set-ups shall include a quarter turn ball valve before and after the meter. Meter couplings, and piping from and including the curb stop connecting fitting (except the meter) shall be owned and maintained by the property owner.

GROUNDING WIRE

No electrical grounding wires shall be connected to any water service.

METERS REQUIRED

Meters shall be required to any building or parcel which takes water from the District for any use. Single family residential properties shall meter individually with a 5/8-inch meter. Managed residential multi rental properties (i.e. duplex, apartments, and multifamily) shall have each building metered as one. Multi-unit, non-managed, non-rental residential properties (i.e. condominiums, townhouses, duel-owner duplex units) shall be metered individually. Lateral connections which exist prior to the adoption of these rules shall pay a "in lieu of meter" lateral connection fee as defined in the rate table. Bypassing or tampering with meters shall result in termination of service.

TESTING

Testing shall be in accordance with AWWA c-600. No pipeline is to be placed under pressure or subjected to hydrostatic pressure until at least 5 days have elapsed after the poured concrete thrust blocks have been installed. If high early strength concrete is used in the concrete thrust blocks, the hydrostatic pressure can be applied to the main after 2 days have elapsed from time of construction of the thrust blocks. New water mains shall be filled and flushed under the direct supervision of the Water District. All air shall be expelled from the line prior to testing. The test pressure shall be 150 psi or 1.5 times the working pressure, whichever is greater. Test pressure shall not exceed the rated pressure of the valves with the pressure boundary of the test section includes closed, resilient-seated gate valves or butterfly valves. The test duration shall be 2 hours. Allowable leaking shall be based on section 4.1 of AWWA C-600.

DISINFECTION

After an acceptable pressure test, the new water mains shall be chlorinated in accordance with AWWA C-601 and 651. Chlorine shall be introduced through a tap at one end of the pipeline while water is withdrawn from the opposite. Chlorine dosage must be sufficient to produce a minimum in the pipeline of 50 mg/l. Following a 24-hour contact period, the treated water shall be flushed from the mains and samples (as determined by the Water District) taken for Coliform and background bacteria. A set of repeat samples (a minimum of 24-hours apart) must also be taken only if a positive sample is reported. Mains will not be accepted or approved for service connections until all required samples show zero bacteria counts. The contractor shall re-disinfect and resample until mains are acceptable. All valves and hydrants within the treated section shall be operated to ensure disinfection of the appurtenances. Following the chlorination period, all treated water shall be flushed from the lines at their extremities and replaced with water from the distribution system. All treated water flushed from the lines shall be disposed of in accordance with an approved means provided in AWWA C-651. Flushing shall be done in strict conformance with all applicable local, state and federal regulations. Contractor or builder is responsible for no discharge of chlorinated water to any storm sewer of natural watercourse will be allowed.

MATERIALS

PIPE

Water mains shall be cement lined ductile iron water mains, with bitumen coating inside and out, with a minimum nominal diameter of 8-inches. Pipe shall conform to the requirements of ANSI A21-50, A21.51, and AWWA C-150, C-151. All pipes shall be Class 52 with push-on joints.

JOINTS

All ductile iron pipe joints shall conform to AWWA C111.

MECHANICAL JOINT RESTRAINTS

Where indicated or necessary to prevent joints or sleeve couplings from pulling apart under pressure, anchoring and joint restraint methods shall be utilized. Methods shall be restrained joint systems. Restrained joint system for standard mechanical joint or push-on joint pipe shall be Megalug or Coverall by EBAA Iron Sales, Inc., Eastland, TX; Fast-grip joint by American Cast Iron Pipe Company, Birmingham, AL; Field Lok 350 Gasket by Untitled Pipe and Foundry Company, Birmingham, AL; or approved equal. Methods that rely on the use of friction clamps and/or retainer glands with set screws alone are not acceptable.

COUPLINGS

Couplings used in the installation, joining or repair of the water main shall be approved by the North Carver Water District.

PIPE FITTINGS

Fittings shall be cement lined ductile iron with bitumen coating inside and out. Fittings shall conform to the requirements of ANSI A21.53 and AWWA C-153 and shall be of a pressure classification at least equal to that of the pipe with which they are used. Fittings shall be mechanical joint conforming to ANSI 21.11 and AWWA C-111. Unless otherwise indicated, fittings shall have all bell mechanical joint ends. All fittings shall have concrete thrust blocks as detailed in drawings.

VALVES

Gate valves shall be iron body, bronze mounted, double disc, side wedge type, non-rising stem with "O" ring seals. Valves shall be New York Pattern, metropolitan type conforming to the requirements of AWWA C-500. Resilient seat gate valves conforming to AWWA C-509 are acceptable. All valves shall have mechanical joint ends and shall open right or clockwise. Valves shall be approved by the Water District prior to installation and be equivalent to the type manufactured by Mueller, Inc. or a manufacturer approved by the Water District.

VALVE BOXES

All gate and valve boxes shall be operated through a North American made water valve box. The box shall consist of a cover marked "Water," a bell or flared base, and a 5 ¼-inch diameter flanged sliding topo. The valve box shall measure the length from the valve body to the finished grade plus six-inches. All valve nuts shall be centered and plumb in the box at a depth of between 4 ½-and-6-feet below final grade. Valves buried greater than 6-feet below final grade will require a centering extension rod drilled and tapped onto the valve nut.

VALVE BOX EXTENSIONS

Valve boxes may be brought to final grade utilizing 5 ¼-by- 12-inch valve box flanged extensions. Pioneer style extensions are not acceptable for this application.

TAPPING SLEEVES

The tapping valves shall be of the resilient seated gate type in conformance with the requirements of AWWA C-509. The valve shall be iron body, bronze-mounted, tapping by mechanical joint ends, equipped for manual operation and shall OPEN RIGHT—CLOCKWISE. Tapping sleeves shall be constructed of two cast iron or stainless steel sections for easy installation and are assembled around the main without halting service. The sleeve shall be furnished complete with joint accessories. The sleeve shall be of the mechanical type with a rated working pressure of 300psi. Tapping sleeves and valves shall be equivalent to the type manufactured by Clow Valve Co., M&H Valve Co., or Mueller.

HYDRANTS

Hydrants shall be American-Darling Model B-50 Mueller Centurion 200 conforming to the requirements of AWWA C-502. Hydrants will have a minimum 5 ¼-inch diameter valve opening and a 7-inch diameter barrel. Hydrants shall open left or counter clockwise and have 5' 6" depth of bury. Hydrants shall have two 2 ½" nozzles and one 5" nozzle.

GRANULAR FILL MATERIALS

Materials shall conform to the Commonwealth of Massachusetts "Standard Specifications for Highway and Bridges" latest edition.

CONCRETE

Materials shall conform to the Commonwealth of Massachusetts "Standard Specifications for Highway and Bridges" latest edition. Cement: Type 11 Portland cement conforming to ASTM C-150.

INSPECTION AND ACCEPTANCE

All materials and construction are subject to the approval of the North Carver Water District and/or its designated inspector. The contractor shall not cover any work prior to approval. The contractor is responsible for correcting all deficiencies to the satisfaction of the Water District and/or designated inspector. Approval shall in no way affect the obligation of the contractor to repair or renew subsequent deficiencies.

CONSTRUCTION

EXCAVATIONS

Excavations that cross or extend into the public right-of-way shall be saw cut and backfilled. Flowable fill shall not be used unless specifically permitted by the Carver DPW Director. Contractor is responsible for maintaining at least one lane of traffic flow using road plates or barricades. Trenches shall be excavated to the depth indicated on the drawings or as directed by the Water District or its designated inspector and in widths sufficient for laying of the mains and appurtenances. All pipes shall have a minimum of 4' 6" and maximum of 5' 6" of

cover. Binder course shall be a minimum of 3-inches, set in place to accommodate a minimum of 2-inches of finished top course. Finished asphalt shall be rolled to a flat uniform surface. The DPW shall issue a road cut permit which may include additional conditions or requirements.

TRENCHING AND BACKFILLING

The minimum depth of cover over the spring line, crown or top of the pipe shall not be less than 4 ½-feet at the time of installation. The trench bottom and sidewalls shall be free of boulders, protruding ledge, stones larger than 4-inches, roots, trash, asphalt, debris or other unsuitable materials. Backfill materials shall be compacted in 12-inch lifts except where "flowable fill" is specifically permitted. Any trench or backfill that is unsuitable in the opinion of the District due to depth, wetness or clay content shall be rejected for use.

Trench bottoms shall be at a uniform depth to grade at installation. Irregular trench bottoms may be made uniform using a bedding material 6-inches in depth. Bedding material shall meet the same standards as the backfill previously described. Pipes shall be only in dry trenches. All open ends of pipe shall be closed off to prevent water, dirt, animals or other foreign substances from entering the pipe.

If used, wood sheeting shall not be withdrawn if driven below the midpoint of the pipe. Sheeting shall be cut off no lower than 1-foot above the top of the pipe.

Blasting, if required, shall be conducted in full compliance with all laws of the state and local ordinances. The contractor is responsible for obtaining all permits and ensuring public safety.

All valves and hydrants shall be set plumb in true vertical alignment and all valve boxes shall be installed vertically, centered over the operating nut. The elevation of the top shall be set to finished grade.

PLANS

Single Service: Plans for a single residential service shall be required. The proposed location of the water service shall be shown on the plan in relation to the dwelling and roadway. The precise location of the water service may be altered in the filed with the concurrence of the Water District. A detailed plan may be required for installations greater than 150-feet in length, that cross wet or wooded lots, are within 10-feet of a septic system, require a meter pit, or where a plan would benefit the Water District.

Water Mains: Request for water mains must be pre-approved by the Water Commissioners. The minimum main shall be 8-inch. The pre-approval of water mains requires the submission of plans prepared by a professional engineer. All plans shall contain the note: "Installation of all mains, valves, hydrants and services shall be in accordance with the latest published North Carver Water District Specifications and Rate Schedules." The Water Commission requires the submission of the following plans for approval:

1. **Technical Review Plans:** The review plans shall indicate the general layout of the water improvements in relation to other underground utilities and lots. A profile is not required. The plans shall contain all notes and details necessary for the District to review the plan.
2. **Field Plans:** The field plans are the review plans with all the revisions noted from the review process. Field plans are used by the Water Commission during pre-construction and construction activities for planning and inspection purposes. Construction plans are not acceptable for use as filed plans. During pre-construction and construction activities, the District may agree to, or require, minor modifications to the field plan if the revision benefits the District. Field plans shall be prepared on **1 sheet** and contain no

non-water related information. Three copies of the field plan will be supplied directly to the Water Commission before the pre-construction site meeting.

3. **As-Built Plans:** As-built plans shall be submitted to the North Carver Water District upon completion of the work. As-built plans shall accurately reflect the installation of the water main. As-built plans shall be clearly marked as such. As-built plans will be used in retainage reduction inspections of the completed work. Submission of as-built plans to the Water Commission is required before the release of any water related securities held by the North Carver Water District. As-built plans shall be similar to field plans, but include the measurements, swing ties, depths and other information relating to the installation. As-built plans shall be prepared and stamped by a professional engineer or land surveyor in accordance with the requirements of the District.

Appendix D
North Carver Water District Fee Schedule of Charges

Inspections: $25 per service and $25 per callback

Turn on/off: $50 each time ($75 after hours) for ½ hour maximum. Any unusual conditions which require additional assets will be billed to the customer at a time and material rate plus a 15% mark-up.

Cellar Repair: $50 per hour, per man, plus parts ($75 after hours)

Locating Gates & Services on Private Property: $50 per hour ($75 after hours). No guarantee is given.

Final Reading: $20

Pressure Testing: $50 per hour, per man ($75 after hours)

Water Main Filling and Flushing: (preparation for pressure test and chlorination). $200 not including labor charges.

Flushing Chlorine from Main: Based on size of main—not including labor charges

4" = $250
6" = $300
8" = $350
12" = $400

Water Service Application Fee: $100

Backflow Prevention Device Testing: $75

Cross Connection Survey: $75 per hour; 1 hour minimum

Private Fire Service Backflow Prevention Device Testing: $75 Plus $3/sprinkler head

Annual Fire Protection Service Charge: $1500 Annually. Based on a 6" connection

Temporary Service: $1500 Plus the cost of any water used

Engineering costs for reviewing development/extension plans: Plans shall be submitted with an initial $500 fee. The developer shall assume all costs in excess of the $500 for a complete review, if the size and nature of the project exceeds the minimum charge.

Attachment C

Geotechnical Report (Sanborn Head)

SANBORN HEAD
Building Trust. Engineering Success.

98 N. Washington Street, Suite 101
Boston, MA 02114

Mr. Peter Sorensen, P.E.
Mr. Wayne Amico, P.E.
Vanasse Hangen Brustlin, Inc.
101 Walnut Street
Watertown, Massachusetts 02472

March 29, 2021
File No. 4250.03

Re: Geotechnical and Hydrogeological Engineering Letter – Rev. 01
Route 58 and Montello Street – Roadway Improvements
Carver, Massachusetts

Dear Peter and Wayne:

Sanborn, Head & Associates, Inc. (Sanborn Head) has prepared this letter to transmit geotechnical and hydrogeological subsurface information to support mast arm foundation, stormwater, and recommendations for the culvert replacement for the Route 58 and Montello Street interchange project in Carver, Massachusetts, as shown on Figure 1 in Attachment A. This letter supersedes our Geotechnical and Hydrologeological Engineering letter, dated February 12, 2021, and was revised to include the bearing resistance of the proposed culvert's foundations at the Strength and Service Limit States in accordance with the American Association of State Highway and Transportation Officials (AASTHO) Load Factor and Resistance Design (LFRD).

PROJECT UNDERSTANDING

We understand the project consists of relocating the intersection of Montello Street and Route 58 approximately 400 feet north of its current location in Carver, Massachusetts. The project includes construction of new traffic signal mast arms, stormwater management features, and replacement of the existing culvert over an intermittent streambed below Montello Street. We understand the proposed culvert consists of an eight-foot wide, pre-cast, open bottom, box or arch culvert with associated wing walls. The grade at the bottom of the culvert is approximately El. 75.5 feet. The approximate locations of the proposed improvements are shown on Figure 2 in Attachment A. Sanborn Head was not provided final grades of the new intersection; however, we understand fills of less than 3 feet are proposed. The elevations in the report reference the North American Vertical Datum of 1988 (NAVD 88).

SUBSURFACE EXPLORATION PROGRAM

Between December 23 and 30, 2020, nine (9) test borings (identified as B1 through B9), four (4) test pits (identified as TP1 through TP4), and four (4) pavement cores (identified as PC1 through PC4) were advanced at the Site. The test borings and pavement cores were drilled by Soil X Corporation (SoilX) of Leominster, Massachusetts and observed by Sanborn Head. The test borings were advanced using hollow-stem auger drilling methods to depths ranging

from approximately 17 to 32 feet below ground surface (bgs), and the test pits were excavated by NRC Environmental Services, Inc, of Franklin, Massachusetts to depths between 8 and 11 feet bgs. The exploration locations are shown on Figure 2 in Attachment A.

Standard Penetration Tests (SPT) were completed and split-spoon samples were obtained at the test boring locations in general accordance with the ASTM International Standard D1586. Soil samples were field classified by Sanborn Head personnel using the Modified Burmister System based on visual estimates of grain size distribution. Additional soil characteristics such as density and consistency (based on SPT data), color, and moisture were also noted on the boring logs. Test boring logs and a legend describing the soil classification system are provided in Attachment B.

The pavement cores consisted of advancing the split-spoon sampler approximately six (6) inches through the pavement on Montello Street and Main Street to measure the existing pavement thickness. Sanborn Head measured the existing pavement thickness in the sidewalls of the pavement cores at the locations shown on Figure 2 (labeled as PC-series explorations). No pavement cores samples were collected at the locations.

The test pit explorations were observed by Sanborn Head personnel on a full-time basis and were field classified using the United States Department of Agriculture (USDA) soil textural classification system). Test pit logs were prepared by Sanborn Head and are included in Attachment C.

Exploration locations are based on tape measurements made in the field by Sanborn Head relative to prominent site features. Locations should be considered accurate only to the degree implied by the method used. Ground surface elevations were estimated based on contours shown on plans entitled 'Carver, MA - Main Street at Montello Street - Boring Plan' (Site Plan) prepared by VHB.

SUBSURFACE CONDITIONS

The following subsurface conditions were encountered in the explorations at the Site:

Topsoil/Subsoil: Approximately 0.5 to 1.7 feet of topsoil and subsoil was observed below the ground surface with the exception of test boring locations B1 and B2 where fill was encountered.

Fill: Approximately 6 to 10 feet of fill was observed at test boring locations B1 and B2. The fill consists of very loose to medium dense, fine to coarse sand with varying amounts of gravel and silt, and few non-soil constituents such as wood, asphalt and root particles.

Organic Silty Sand: An approximately 4-foot thick layer of organic silty sand was observed below the fill at test boring location B2. The material consists of loose fine to medium sand with some silt, trace gravel, and few decomposed plant particles. The layer is likely associated with the wetlands and brook located approximately 5 feet north of the test boring.

Upper Sand Layer: An approximately 4- to 15-foot thick layer of sand was encountered below topsoil in test boring B3 through B9. The sand consists of very loose to medium dense sand with varying amount of silt and gravel.

Sand and Silt Layer: A layer of sand and silt was encountered below the fill, organic silty sand and/or upper sand layer. The material consists of loose to dense, fine to coarse sand and silt.

Lower Sand Layer: Where the sand and silt layer was fully penetrated, a lower sand layer was encountered at test boring locations B7, B8 and B9. The material consists of medium dense to dense, fine to medium sand and trace silt. The lower sand layer was not fully penetrated at the test boring locations.

Groundwater: Groundwater was typically observed at depths ranging between 4 to 7 feet bgs. Our observations of the redoximorphic features indicative of estimated seasonal high groundwater (ESHGW) in the stormwater management areas are included in the Hydrogeologic Engineering Recommendations section below.

It should be noted that the groundwater level measurements were made in the test borings at the time of drilling and may not be representative of stabilized groundwater conditions.

GEOTECHNICAL ENGINEERING RECOMMENDATIONS

The following sections include our recommendations for the design and construction of traffic signal mast arm foundations, the results of the pavement thickness evaluation, and recommendation for the design and construction of the culvert and wing wall replacement. The recommendations in this report are subject to the limitations included in Attachment D.

Mast Arm Recommendations

Based on the subsurface conditions observed at the proposed mast arm locations, which typically consist of wet, loose to medium dense sand overlaying a loose to dense sand and silt layer, it is our opinion that the soil type at the mast arm foundation locations is most appropriately categorized as “Wet Sand (Loose)” in accordance with the Massachusetts Department of Transportation (MassDOT) Standard Drawing for “Overhead Signal Structure & Foundation Mast Arm Cored Pier Foundations”. The MassDOT Standard Drawing for mast arm pier foundations is reproduced in Attachment E for reference.

Consistent with the MassDOT Standard Drawing requirements (Attachment E – Note 7), we recommend that the pier foundations be drilled using a cased borehole to maintain the integrity of the shaft excavation due to the presence of loose, wet sands which have the potential for collapse. Additionally, concrete should be placed using a tremie pipe at the bottom of the excavation or pumping methods if groundwater cannot be adequately removed during pier construction.

Existing Pavement Thickness

The existing pavement thicknesses measured at the pavement core locations and at test boring locations in roadways are summarized below.

Exploration ID	Street Location	Thickness (inches)
PC1	Montello Street	2.5
PC2	Main Street (Route 58)	8.0
PC3	Main Street (Route 58)	7.0
PC4	Montello Street	3.0
B1	Montello Street	3.0

In addition to the pavement thickness measurements, we observed several asphalt patches in the pavement surface of Montello Street and "alligator cracking" at several locations. The observations indicate a weakened subgrade (possibly influenced by saturated subgrade soils). Based on our observations, pavement rehabilitation should include full depth replacement of the pavement and base course section.

Culvert and Wing Wall Recommendations

Foundation Recommendations

We recommend the proposed pre-cast culvert and wing wall structures be supported by cast-in-place concrete strip footing(s) bearing on the natural, inorganic, granular soil. The design of the footings should consider the following.

- Strip footings should be designed to be 2 feet wide.
- Footings should bear at least four (4) feet below grade for frost protection.
- Footings should be protected from scour, with riprap or other scour-protection as appropriate.
- The footing subgrades should be over excavated by at least 12-inches and backfilled to the footing subgrade with 1.5-inch crushed stone to protect the sand and silt subgrade from strength degradation due to excess moisture. A non-woven geotextile fabric, such as a Mirafi 140N, should be placed on the subgrade to underlie the crushed stone. The Contractor should consider only excavating areas that can be backfilled within the workday to minimize dewatering. The Contractor may elect to pour a lean concrete (mud mat) in lieu of the crushed stone.
- The topsoil, fill or organic silty sand should be excavated down to the natural, inorganic, granular (sand and silt) soil layer. The subgrade prepared as specified herein.
- Dewatering will be required to maintain the stability of the bottom of the footing excavations and allow for backfill and installation of the culvert and wingwalls. The method for controlling groundwater will be determined by the Contractor and may include localized sumps or well points depending on the sequence of the work.
- Subsurface utilities installed below the culvert should have a minimum of two feet of cover between the top of the utility and the bottom of the footing. The utility piping

should be encased in concrete and be rated for a minimum of 20 feet of depth cover to account for the vertical pressure from the footings above.

- A coefficient of friction of 0.50 is recommended for cast-in-place concrete on 1.5-inch crushed stone or a lean, concrete mud mat.

Factored Bearing Resistance

Provided the footing subgrade is prepared as specified herein, the proposed culvert may be supported by a 2-foot wide concrete footing Service or Strength Limit State as follows:

- Service Limit State: q_R = 2.0 kips per square foot (ksf)
- Strength Limit State: q_R = 2.0 ksf

Based on a factored bearing resistance of 2.0 ksf, we anticipate the estimated total settlement will be on the order of 3/4-inches and an estimated post-construction differential settlement of less than ½-inch. Calculations supporting the factored bearing resistances are included in Attachment F.

Lateral Earth Pressures and Grading Recommendations

The culvert and the wing walls should be designed to resist lateral earth pressures as shown in the figure below. Based on our observations in borings B1 and B2 during drilling, we recommend a design groundwater elevation of 75.0 feet for the culvert. As such, the lateral earth pressure provided below do not consider hydrostatic pressure. Should the bottom of the culvert extend below El. 75.0, the culvert should be designed to resist hydrostatic pressure.

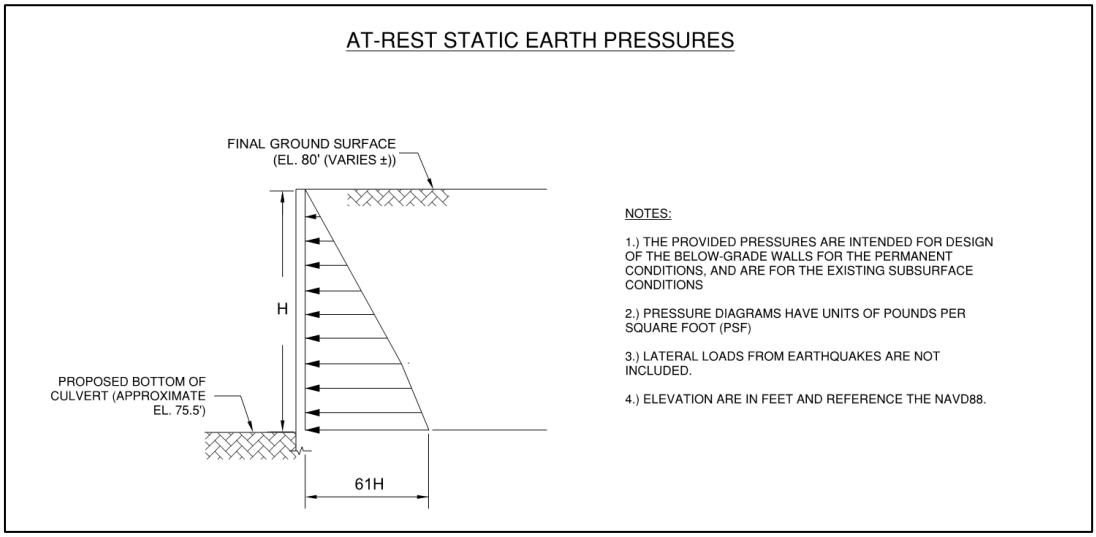


Figure A - At-rest Earth Pressure Diagram

Proposed slopes behind the culvert and wing walls should be constructed such that the slope is no steeper than 2H:1V. If steeper slopes are required to tie the proposed grades into the wingwalls, the slope should be reinforced with a minimum of 18-inches of riprap underlain by a woven geotextile fabric.

Construction Recommendations

Due to the anticipated depth of excavation and the proximity of the culvert and wing wall footings to the streambed, temporary diversion barriers will be required to re-direct surface water away from the excavation during construction. Additionally, dewatering will be required to maintain the stability of the bottom of the excavation and create a workably dry working pad. The method for controlling water will be determined by the Contractor. The Contractor should submit a temporary diversion and dewatering plan to the Engineer for review prior to construction. The stream diversion and dewatering plan should be developed to meet local, state, and federal regulations.

Clearing and grubbing, excavation, fill to raise the grade, and backfill of the culvert and wing wall structure should be conducted in accordance with Division II of the MassDOT Standard Design Specifications. Import materials or on-site materials intended for use as fill to raise the grade or pavement basecourse should be submitted by the contractor in accordance with Section M of the MassDOT Standard Design Specifications.

We assumed the culvert will be constructed as an open cut. Temporary construction slopes to install the culvert should be performed in accordance with the Occupational Safety and Health Administration's (OSHA) Section 1926 Subpart P App B – Sloping and Benching for Soil Type C.

HYDROGEOLOGICAL ENGINEERING RECOMMENDATIONS

Four (4) test pits were excavated in the proposed stormwater management areas to evaluate the soil's ability to infiltrate stormwater and to estimate seasonal high groundwater to inform stormwater design. Our recommendations are described below and are based on our observations in the test pits.

Recommendation for Estimated Seasonal High Groundwater

We recommend the estimated seasonal high groundwater (ESHGW) at the proposed stormwater management areas be taken at the following elevations:

- Stormwater Management Area 1: El. 76 feet
- Stormwater Management Area 2: El. 78 feet

Please note the ESHGW elevations are based on the contours shown on the Site Plan.

Recommendations for Stormwater Infiltration Rate

Based on the subsurface conditions observed across the project area, the natural sand and silt layer is the most restrictive soil stratum at both stormwater management areas. Sanborn Head collected two (2) samples of the sand and silt layer and submitted the samples to a geotechnical testing laboratory for grain-size analysis. The laboratory results indicate that the USDA textural classification of the sand and silt layer is variable and includes both Silt Loam (generally in the southern portions of the project area) and Sandy Loam (generally in

the northern portions of the project area) soils. The recommended infiltration rates for these soil textures are summarized in the table below and correspond to the Rawl's Rate presented in Table 2.3.3 of the Massachusetts Stormwater Handbook:

Stormwater Management Area	Test Boring Location	Sample ID	Test Depth (in)	Soil Type	Soil Sample Textural Classification	Infiltration rate (in/hr)
1	TP2	C1	30	Sand & Silt	Silt Loam	0.27
2	TP4	C2	36	Sand & Silt	Sandy Loam	1.02

The geotechnical laboratory results are provided in Attachment G.

We trust this letter meets the current needs of the project. If you have any questions, please contact the undersigned at 857.327.9731.

Very truly yours,
SANBORN, HEAD & ASSOCIATES, INC.

Quincy Pratt, P.E.
Senior Project Manger

Stan S. Sadkowski, P.E.
Senior Vice President

QP/LDN/SSS:jtm

Enclosures: Attachment A – Exploration Location Plan
Attachment B – Test Boring Logs
Attachment C – USDA Test Pit Logs
Attachment D – Limitations
Attachment E – MassDOT Standard Drawing (Mast Arm Pier Foundations)
Attachment F – Bearing Resistance Calculations
Attachment G – Laboratory Results

\\bosserv1\shdata\SHDATA\4200s\4250.03\Source Files\GT and HG Memo Rev. 01\20210329 Route 58 Montello St GT and HG Memo - Rev. 01.docx

ATTACHMENT A

EXPLORATION LOCATION PLAN

N
W E
S

NOTES:
Base map was taken from the "Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Information Technology Division"
7.5 minute USGS Quadrangle Maps: Plympton, Massachusetts, REV: 1977

Drawn By: C.Dias
Designed By: J.McCarthy
Reviewed By: S.Sadkowski
Project No: 4250.03
Date: March 2021

SCALE: 1:25,000

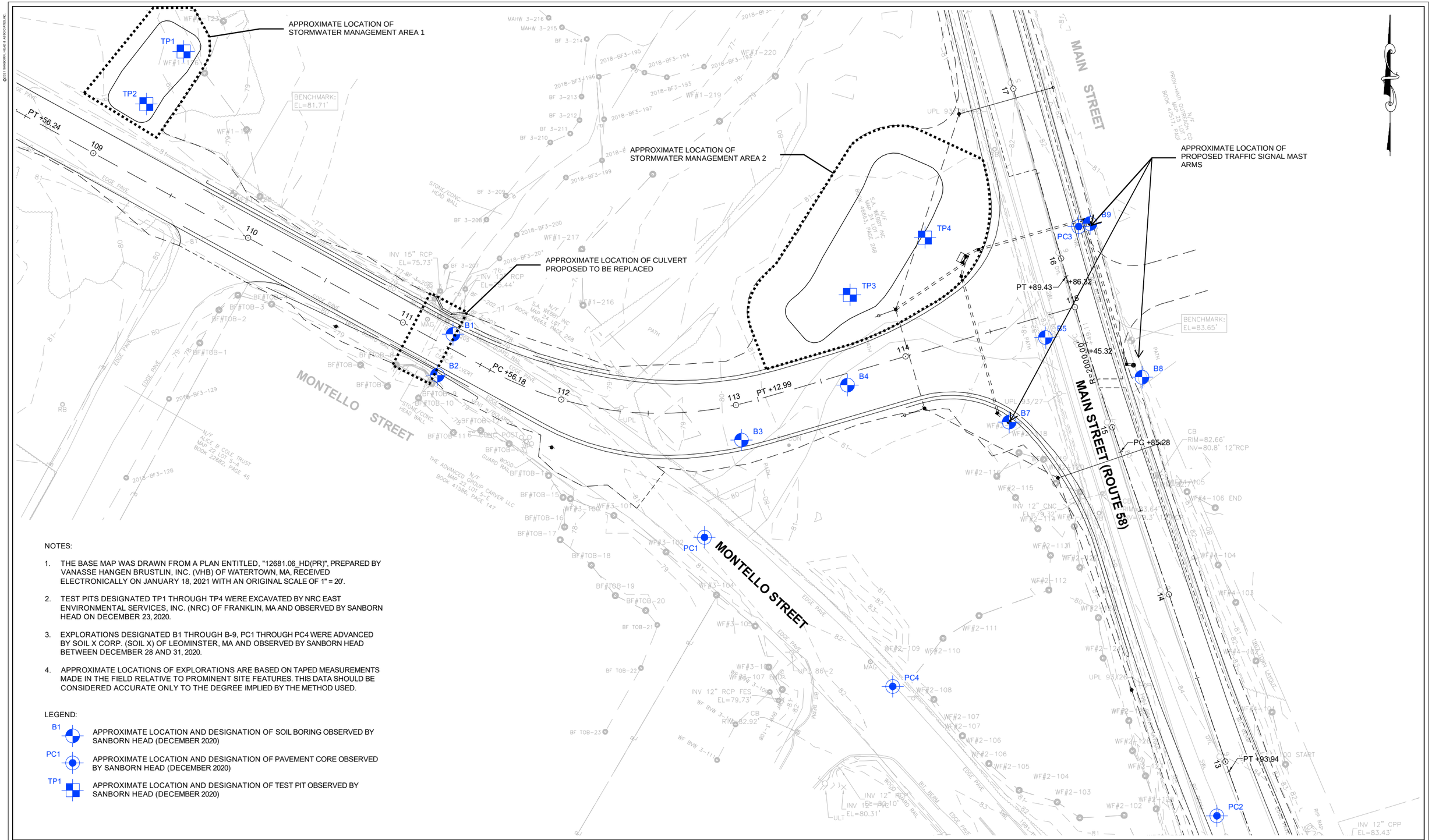
SANBORN HEAD

Figure 1

Locus Plan

Geotechnical & Hydrogeological Engineering Memorandum

Route 58 & Montello Street
- Roadway Improvements
Carver, Massachusetts



NOTES:

1. THE BASE MAP WAS DRAWN FROM A PLAN ENTITLED, "12681.06_HD(PR)", PREPARED BY VANASSE HANGEN BRUSTLIN, INC. (VHB) OF WATERTOWN, MA, RECEIVED ELECTRONICALLY ON JANUARY 18, 2021 WITH AN ORIGINAL SCALE OF 1" = 20'.
2. TEST PITS DESIGNATED TP1 THROUGH TP4 WERE EXCAVATED BY NRC EAST ENVIRONMENTAL SERVICES, INC. (NRC) OF FRANKLIN, MA AND OBSERVED BY SANBORN HEAD ON DECEMBER 23, 2020.
3. EXPLORATIONS DESIGNATED B1 THROUGH B-9, PC1 THROUGH PC4 WERE ADVANCED BY SOIL X CORP. (SOIL X) OF LEOMINSTER, MA AND OBSERVED BY SANBORN HEAD BETWEEN DECEMBER 28 AND 31, 2020.
4. APPROXIMATE LOCATIONS OF EXPLORATIONS ARE BASED ON TAPED MEASUREMENTS MADE IN THE FIELD RELATIVE TO PROMINENT SITE FEATURES. THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

LEGEND:

- B1 — APPROXIMATE LOCATION AND DESIGNATION OF SOIL BORING OBSERVED BY SANBORN HEAD (DECEMBER 2020)
- PC1 — APPROXIMATE LOCATION AND DESIGNATION OF PAVEMENT CORE OBSERVED BY SANBORN HEAD (DECEMBER 2020)
- TP1 — APPROXIMATE LOCATION AND DESIGNATION OF TEST PIT OBSERVED BY SANBORN HEAD (DECEMBER 2020)

SANBORN HEAD

GRAPHICAL SCALE
25' 13' 0' 25' 50'

NO.	DATE	DESCRIPTION	BY

DRAWN BY: C.DIAS
DESIGNED BY: J.MCCARTHY
REVIEWED BY: L.NORTON
PROJECT MGR: Q.PRATT
PIC: S.SADKOWSKI
DATE: MARCH 2021

GEOTECHNICAL & HYDROGEOLOGICAL ENGINEERING MEMORANDUM
ROUTE 58 & MONTELLO STREET
- ROADWAY IMPROVEMENTS
CARVER, MASSACHUSETTS

PROJECT NUMBER: 4250.03

EXPLORATION LOCATION PLAN

SHEET NUMBER: 2

ATTACHMENT B

TEST BORING LOGS

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Route 58/Montello 54
Location: Carver, MA
Project No.: 4250.03

Log of Boring B1

Ground Elevation: 80 ± feet
Datum: NAVD 1988

Drilling Method: ATV Mounted Acker Drill Rig, and Hollow Stem Auger

Sampling Method: 2" O.D. Split Spoon, Automatic Hammer

Drilling Company: Soil X Corporation, Inc.

Foreman: G. Guinto

Date Started: 12/28/20 **Date Finished: 12/28/20**

Logged By: J. McCarthy **Checked By: Q. Pratt**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
12/28/20	14:00	7'	Ground Surface	15'	17'	<20 Minutes

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
0							0' ASPHALT	ASPHALT.	
							-----0.3-----		
	S-1	0.5 - 2	19 44 38	18/15				S-1 (0.5 to 2'): Very dense, brown/white, fine to coarse SAND, some Gravel, trace Silt, few Asphalt particles. Moist. FILL.	
2									
4							FILL		
	S-2	5 - 7	4 3 7 4	24/12				S-2 (5 to 7'): Loose, dark brown/gray, fine to coarse SAND, little Gravel, trace Silt, few Wood fragments. Moist. FILL.	
6									
							-----7'-----		
8									
10	S-3	10 - 12	3 3 4 8	24/16				S-3 (10 to 12'): Loose, brown, fine SAND and Silt. Wet.	
12							SAND & SILT		
14									
	S-4	15 - 17	5 7 6 6	24/16				S-4 (15 to 17'): Medium dense, brown, fine SAND, little Silt. Wet.	
16									
							-----17'-----	Boring terminated at 17 feet. No refusal encountered.	
18									
20									
22									
24									

BORING LOG C:\USERS\MRUSSELL\DESKTOP\4250.03 LOGS.GPJ 2017 SANBORN HEAD V1.GLB 2017 SANBORN HEAD V1.GDT 1/26/21

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Route 58/Montello 54
Location: Carver, MA
Project No.: 4250.03

Log of Boring B2

Ground Elevation: 79.5 ± feet
Datum: NAVD 1988

Drilling Method: ATV Mounted Acker Drill Rig, and Hollow Stem Auger

Sampling Method: 2" O.D. Split Spoon, Automatic Hammer

Drilling Company: Soil X Corporation, Inc.

Foreman: G. Guinto

Date Started: 12/29/20 **Date Finished: 12/29/20**

Logged By: J. McCarthy **Checked By: Q. Pratt**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
12/29/20	08:45	5'	Ground Surface	20'	22'	<20 Minutes

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
0	S-1	0 - 2	2 5 5 25	24/12			-----0'----- TOPSOIL -----0.5'-----	S-1A (0 to 0.5'): Loose, dark brown, fine to coarse SAND, little Silt, little Gravel, common Root particles, very few Grass particles. Moist. TOPSOIL.	
2							FILL	S-1B (0.5 to 2'): Loose, brown, fine to coarse SAND, little Gravel, trace Silt, very few Root particles. Moist. FILL.	
4	S-2	5 - 7	2 2 4 6	24/13				S-2A (5 to 6'): Loose, brown, fine to coarse SAND, little Gravel, trace Silt, very few Root particles. Wet. FILL.	
6							-----6'-----	S-2B (6 to 7'): Loose, gray, fine to medium SAND, some Silt, trace Gravel, few decomposed Plant particles. Wet.	
8							ORGANIC SILTY SAND		
10	S-3	10 - 12	4 6 4 6	24/13			-----10'-----	S-3 (10 to 12'): Loose, brown, fine to medium SAND and SILT, trace Gravel. Wet.	
12									
14									
16	S-4	15 - 17	4 4 5 5	24/16			SAND & SILT	S-4 (15 to 17'): Loose, brown, fine SAND and SILT. Wet.	
18									
20	S-5	20 - 22	3 2 3 4	24/12				S-5A (20 to 21'): Loose, brown, fine SAND and SILT. Wet.	
							-----21'-----		
22							SAND & SILT -----22'-----	S-5B (21 to 22'): Loose, brown, fine to medium SAND, trace Silt. Wet. Boring terminated at 22 feet. No refusal encountered.	
24									

BORING LOG C:\USERS\MRUSSELL\DESKTOP\4250.03 LOGS.GPJ 2017 SANBORN HEAD V1.GLB 2017 SANBORN HEAD V1.GDT 1/26/21

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Route 58/Montello 54
Location: Carver, MA
Project No.: 4250.03

Log of Boring B3

Ground Elevation: 80 ± feet
Datum: NAVD 1988

Drilling Method: ATV Mounted Acker Drill Rig, and Hollow Stem Auger

Sampling Method: 2" O.D. Split Spoon, Automatic Hammer

Drilling Company: Soil X Corporation, Inc.

Foreman: G. Guinto

Date Started: 12/30/20 **Date Finished: 12/30/20**

Logged By: J. McCarthy **Checked By: Q. Pratt**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
12/30/20	10:30	3'	Ground Surface	20'	22'	<10 Minutes

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
0	S-1	0 - 2	2 1 3 5	24/13			-----0'-----	S-1A (0 to 1'): Very loose, dark brown, fine to coarse SAND, little Silt, trace Gravel, common Root particles, few Leaf particles. TOPSOIL.	
							TOPSOIL		
1							-----1'-----	S-1B (1 to 2'): Very loose, brown, fine to coarse SAND, little Gravel, trace Silt. Moist.	
2									
3							SAND		
4									
5	S-2	5 - 7	7 8 9 11	24/16			-----5'-----	S-2 (5 to 7'): Medium dense, brown, fine to coarse SAND and SILT. Wet.	
6									
8									
10	S-3	10 - 12	6 8 5 6	24/15				S-3 (10 to 12'): Medium dense, brown/gray, fine SAND, some Silt. Wet.	
12									
13							SAND & SILT		
14									
15	S-4	15 - 17	2 4 4 6	24/5				S-4 (15 to 17'): Loose, gray, fine SAND, some Silt. Wet.	
16									
18									
20	S-5	20 - 22	2 4 4 6	24/17				S-5 (20 to 22'): Loose, brown, fine to coarse SAND, trace Silt. Wet.	
22							-----22'-----	Boring terminated at 22 feet. No refusal encountered.	
24									

BORING LOG C:\USERS\MRUSSELL\DESKTOP\4250.03 LOGS.GPJ 2017 SANBORN HEAD V1.GLB 2017 SANBORN HEAD V1.GDT 1/26/21

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Route 58/Montello 54
Location: Carver, MA
Project No.: 4250.03

Log of Boring B4

Ground Elevation: 81.5 ± feet
Datum: NAVD 1988

Drilling Method: ATV Mounted Acker Drill Rig, and Hollow Stem Auger

Sampling Method: 2" O.D. Split Spoon, Automatic Hammer

Drilling Company: Soil X Corporation, Inc.

Foreman: G. Guinto

Date Started: 12/30/20 **Date Finished: 12/30/20**

Logged By: J. McCarthy **Checked By: Q. Pratt**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
12/30/20	08:30	5'	Ground Surface	5'	7'	-

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
0	S-1	0 - 2	2 2 2 3	24/4			-----0'----- TOPSOIL -----1'-----	S-1A (0 to 1'): Very loose, dark brown, fine to coarse SAND, little Silt, trace Gravel, common Root particles, very few Leaf particles. Moist. TOPSOIL.	
2							SAND	S-1B (1 to 2'): Very loose, brown, fine to coarse SAND, little Gravel, trace Silt, very few Root particles. Moist.	
4									
6	S-2	5 - 7	12 9 8 8	24/12			-----5.5'-----	S-2A (5 to 5.5'): Medium dense, brown/gray, fine to coarse SAND, some Gravel, trace Silt. Wet. S-2B (5.5 to 7'): Medium dense, brown, fine SAND and SILT. Wet.	
8									
10	S-3	10 - 12	4 8 7 9	24/12			SAND & SILT	S-3 (10 to 12'): Medium dense, brown, fine SAND and SILT. Wet.	
12									
14									
16	S-4	15 - 17	4 8 8 7	24/18			-----17'-----	S-4 (15 to 17'): Medium dense, brown/gray, fine SAND and SILT. Wet. Boring terminated at 17 feet. No refusal encountered.	
18									
20									
22									
24									

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Route 58/Montello 54
Location: Carver, MA
Project No.: 4250.03

Log of Boring B5

Ground Elevation: 81 ± feet
Datum: NAVD 1988

Drilling Method: ATV Mounted Acker Drill Rig, and Hollow Stem Auger

Sampling Method: 2" O.D. Split Spoon, Automatic Hammer

Drilling Company: Soil X Corporation, Inc.

Foreman: G. Guinto

Date Started: 12/29/20 **Date Finished: 12/29/20**

Logged By: J. McCarthy **Checked By: Q. Pratt**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
12/29/20	13:45	4.5'	Ground Surface	20'	22'	<5 Minutes

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
0	S-1	0 - 2	2 2 3 2	24/16			-----0'-----	S-1A (0 to 1'): Loose, dark brown, fine SAND, little Silt, trace Gravel, common Root particles, very few Leaf particles, very few Wood particles. Moist. TOPSOIL.	
							TOPSOIL		
							-----1'-----		
2								S-1B (1 to 2'): Loose, brown, fine to medium SAND, little Gravel, trace Silt, very few Root particles. Moist.	
							SAND		
4									
	S-2	5 - 7	5 5 5 5	24/13			-----5'-----	S-2 (5 to 7'): Loose, brown, fine SAND and SILT. Wet.	
6									
8									
10	S-3	10 - 12	5 6 6 7	24/12				S-3 (10 to 12'): Medium dense, brown/gray, fine SAND and SILT. Wet.	
12									
							SAND & SILT		
14									
	S-4	15 - 17	2 4 3 4	24/18				S-4 (15 to 17'): Loose, brown/gray, fine SAND and SILT. Wet. Seam of fine to medium Sand at 16 feet..	
16									
18									
20	S-5	20 - 22	5 6 6 7	24/22				S-5 (20 to 22'): Medium dense, brown/gray, fine SAND and SILT. Wet.	
22							-----22'-----	Boring terminated at 22 feet. No refusal encountered.	
24									

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Route 58/Montello 54
Location: Carver, MA
Project No.: 4250.03

Log of Boring B7

Ground Elevation: 80.5 ± feet
Datum: NAVD 1988

Drilling Method: ATV Mounted Acker Drill Rig, and Hollow Stem Auger

Sampling Method: 2" O.D. Split Spoon, Automatic Hammer

Drilling Company: Soil X Corporation, Inc.

Foreman: G. Guinto

Date Started: 12/29/20 **Date Finished: 12/29/20**

Logged By: J. McCarthy **Checked By: Q. Pratt**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
12/29/20	11:45	5'	Ground Surface	30'	32'	<10 Minutes

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
0	S-1	0 - 2	WOH 1 1 3	24/12			-----0'----- TOPSOIL -----1'-----	S-1A (0 to 1'): Loose, dark brown, fine to coarse SAND, little Silt, little Gravel, common Root particles, few Leaf particles, very few Wood particles. Moist. TOPSOIL.	
2								S-1B (1 to 2'): Very loose, brown, fine to medium SAND, little Silt, trace Gravel, very few Root particles. Moist.	
4									
6	S-2	5 - 7	4 10 10 11	24/16			SAND	S-2 (5 to 7'): Medium dense, brown, fine to medium SAND, some Silt, trace Gravel. Wet.	
8									
10	S-3	10 - 12	2 2 7 8	24/16			-----11'-----	S-3A (10 to 11'): Loose, brown, fine to medium SAND, trace Silt. Wet. S-3B (11 to 12'): Loose, brown, fine SAND and SILT. Wet.	
12									
14									
16	S-4	15 - 17	6 10 10 10	24/16			SILT & SAND	S-4 (15 to 17'): Medium dense, brown, fine SAND and SILT. Wet.	
18									
20	S-5	20 - 22	7 6 6 9	24/16			-----21.5'-----	S-5A (20 to 21.5'): Medium dense, brown, fine SAND and SILT. Wet.	
22							SAND	S-5B (21.5 to 22'): Medium dense, brown, fine to medium SAND, trace Silt. Wet.	
24									

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Route 58/Montello 54
Location: Carver, MA
Project No.: 4250.03

Log of Boring B7

Ground Elevation: 80.5 ± feet
Datum: NAVD 1988

Drilling Method: ATV Mounted Acker Drill Rig, and Hollow Stem Auger

Sampling Method: 2" O.D. Split Spoon, Automatic Hammer

Drilling Company: Soil X Corporation, Inc.

Foreman: G. Guinto

Date Started: 12/29/20 **Date Finished: 12/29/20**

Logged By: J. McCarthy **Checked By: Q. Pratt**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
12/29/20	11:45	5'	Ground Surface	30'	32'	<10 Minutes

Depth (ft)	Sample Information					Stratum		Geologic Description	Remarks
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Log	Description		
26	S-6	25 - 27	2 3 4 3	24/9				S-6 (25 to 27'): Loose, tan, fine to medium SAND, trace Silt. Wet.	
28							SAND		
30	S-7	30 - 32	15 25 21 42	24/15				S-7 (30 to 32'): Dense, brown, fine to medium SAND, trace Silt. Wet.	
32							-----32'-----	Boring terminated at 32 feet. No refusal encountered.	
34									
36									
38									
40									
42									
44									
46									
48									
50									

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Route 58/Montello 54
Location: Carver, MA
Project No.: 4250.03

Log of Boring B8

Ground Elevation: 82 ± feet
Datum: NAVD 1988

Drilling Method: ATV Mounted Acker Drill Rig, and Hollow Stem Auger

Sampling Method: 2" O.D. Split Spoon, Automatic Hammer

Drilling Company: Soil X Corporation, Inc.

Foreman: G. Guinto

Date Started: 12/28/20 **Date Finished: 12/28/20**

Logged By: J. McCarthy **Checked By: Q. Pratt**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
12/28/20	09:00	5'	Ground Surface	30'	32'	<20 Minutes

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
0	S-1	0 - 2	2 5 4 6	24/17			-----0'----- TOPSOIL -----1'-----	S-1A (0 to 1'): Loose, dark brown, fine to coarse SAND, trace Silt, trace Gravel, few Root particles. Moist. TOPSOIL.	
2								S-1B (1 to 2'): Loose, orange/black, fine to coarse SAND, little Silt, trace Gravel, very few Root particles. Moist.	
4									
6	S-2	5 - 7	3 6 5 7	24/11			SAND	S-2 (5 to 7'): Medium dense, brown, fine to medium SAND, little Silt, trace Gravel. Wet.	
8									
10	S-3	10 - 12	3 4 4 6	24/12			-----10'-----	S-3 (10 to 12'): Loose, brown, fine SAND and SILT. Wet.	
12									
14									
16	S-4	15 - 17	4 6 8 10	24/15			SAND & SILT	S-4 (15 to 17'): Medium dense, brown, fine SAND and SILT. Wet.	
18									
20	S-5	20 - 22	7 10 12 12	24/12				S-5 (20 to 22'): Medium dense, brown, fine SAND and Silt. Wet.	
22									
24									

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Route 58/Montello 54
Location: Carver, MA
Project No.: 4250.03

Log of Boring B8

Ground Elevation: 82 ± feet
Datum: NAVD 1988

Drilling Method: ATV Mounted Acker Drill Rig, and Hollow Stem Auger

Sampling Method: 2" O.D. Split Spoon, Automatic Hammer

Drilling Company: Soil X Corporation, Inc.

Foreman: G. Guinto

Date Started: 12/28/20 **Date Finished: 12/28/20**

Logged By: J. McCarthy **Checked By: Q. Pratt**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
12/28/20	09:00	5'	Ground Surface	30'	32'	<20 Minutes

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
26	S-6	25 - 27	5 8 9 10	24/24			SAND & SILT	S-6A (25 to 26.5'): Medium dense, brown, fine SAND, some Silt. Wet.	
							-----26.5'-----		
28							SAND	S-6B (26.5 to 27'): Medium dense, orange, fine to medium SAND, trace Silt. Wet.	
30	S-7	30 - 32	7 10 11 10	24/24				S-7 (30 to 32'): Medium dense, brown, fine to medium SAND, trace Silt. Wet.	
32							-----32'-----	Boring terminated at 32 feet. No refusal encountered.	
34									
36									
38									
40									
42									
44									
46									
48									
50									

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Route 58/Montello 54
Location: Carver, MA
Project No.: 4250.03

Log of Boring B9

Ground Elevation: 82 ± feet
Datum: NAVD 1988

Drilling Method: ATV Mounted Acker Drill Rig, and Hollow Stem Auger

Sampling Method: 2" O.D. Split Spoon, Automatic Hammer

Drilling Company: Soil X Corporation, Inc.

Foreman: G. Guinto

Date Started: 12/28/20 **Date Finished: 12/28/20**

Logged By: J. McCarthy **Checked By: Q. Pratt**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
12/28/20	11:15	3.75'	Ground Surface	30'	32'	<30 Minutes

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
0	S-1	0 - 2	WOH 2 1 2	24/1			-----0'----- TOPSOIL -----0.5'-----	S-1A (0 to 0.5'): Very loose, dark brown, fine to coarse SAND, little Silt, trace Gravel, few Root particles. Moist. TOPSOIL.	
								S-1B (0.5 to 2'): Very loose, brown, fine to coarse SAND, little Silt, very few Root particles. Moist.	
2									
4									
	S-2	5 - 7	5 6 6 6	24/15				S-2 (5 to 7'): Medium dense, brown, fine SAND, little Silt. Wet.	
6									
8							SAND		
10	S-3	10 - 12	5 6 5 5	24/17				S-3 (10 to 12'): Medium dense, brown, fine to coarse SAND, little Silt, little Gravel. Wet.	
12									
14									
	S-4	15 - 17	4 7 7 10	24/18			-----15'-----	S-4 (15 to 17'): Medium dense, brown, fine SAND, little Silt. Wet.	
16									
18									
20	S-5	20 - 22	5 8 8 10	24/16			SAND & SILT	S-5 (20 to 22'): Medium dense, brown, fine to medium SAND, some Silt. Wet.	
22									
24									

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Route 58/Montello 54
Location: Carver, MA
Project No.: 4250.03

Log of Boring B9

Ground Elevation: 82 ± feet
Datum: NAVD 1988

Drilling Method: ATV Mounted Acker Drill Rig, and Hollow Stem Auger

Sampling Method: 2" O.D. Split Spoon, Automatic Hammer

Drilling Company: Soil X Corporation, Inc.

Foreman: G. Guinto

Date Started: 12/28/20 **Date Finished: 12/28/20**

Logged By: J. McCarthy **Checked By: Q. Pratt**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
12/28/20	11:15	3.75'	Ground Surface	30'	32'	<30 Minutes

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
26	S-6	25 - 27	9 10 10 10	24/18			-----25'-----	S-6 (25 to 27'): Medium dense, brown, fine to medium SAND, trace Silt. Wet.	
28							SAND		
30	S-7	30 - 32	12 16 20 27	24/24				S-7 (30 to 32'): Dense, brown, fine to medium SAND, trace Silt. Wet.	
32							-----32'-----	Boring terminated at 32 feet. No refusal encountered.	
34									
36									
38									
40									
42									
44									
46									
48									
50									

BORING LOG C:\USERS\MRUSSELL\DESKTOP\4250.03 LOGS.GPJ 2017 SANBORN HEAD V1.GLB 2017 SANBORN HEAD V1.GDT 1/26/21

ATTACHMENT C

USDA TEST PIT LOGS

Deep Observation Hole

Site Name:	Carver, Massachusetts	Date:	12/22/2020
Site Address:	Montello Street	Time:	9:30
Project No.:	4250.03		
Ground Surface Elev. (ft.):	80.0	Weather :	Sunny, 30s-40s

SANBORN HEAD

Logged by: J. McCarthy/Q. Pratt
Test Pit Number: TP1
Soil Evaluator #: N/A
Signature: N/A

Depth (inches)	Soil Horizon or Layer	Soil Matrix Color (Moist)	Redoximorphic Features			Soil Texture (NRCS)	Coarse Fragments (% by Volume)		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles			
0 - 12	A_p	10YR 4/2	-	-	-	Sandy Loam	<5	0	Weak	Friable	
12 - 20	B	10YR 5/6	-	-	-	Sandy Loam	<5	0	Weak	Friable	
20 - 96	C	5Y 6/2	66	2.5 YR 3/6 5Y 6/2	10	Silt Loam	<5	0	Strong	Firm	
-											
-											
-											
-											

Test Pit Termination Depth (in.): 96 **Reason for Termination:** Target depth achieved

Groundwater Observations:				**In-Situ Testing:**			
Depth to water weeping from pit face (in.):	78			Percolation Test:	Not performed	Depth (in.):	N/A
Depth to standing water in hole (in.):	84	Stabilization Time:	~60 Minutes	Permeameter Test:	Not performed	Depth (in.):	N/A
Depth to estimated seasonal high groundwater [ESHGW] (in.):	66	Basis for ESHGW:	Redoximorphic features	Falling Head Test:	Not performed	Depth (in.):	N/A
				Other Test:	Not performed	Depth (in.):	N/A

Additional Notes:
1.) N/A= Not Applicable

Deep Observation Hole

Site Name:	Carver, Massachusetts	Date:	12/22/2020
Site Address:	Montello Street	Time:	8:30
Project No.:	4250.03		
Ground Surface Elev. (ft.):	80.5	Weather :	Sunny, 30s-40s

SANBORN HEAD

Logged by: J. McCarthy/Q. Pratt
Test Pit Number: TP2
Soil Evaluator #: N/A
Signature: N/A

Depth (inches)	Soil Horizon or Layer	Soil Matrix Color (Moist)	Redoximorphic Features			Soil Texture (NRCS)	Coarse Fragments (% by Volume)		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles			
0 - 12	A_P	10YR 4/2	-	-	-	Sandy Loam	<5	0	Weak	Friable	
12 - 20	B	10YR 5/6	-	-	-	Sandy Loam	<5	0	Weak	Friable	
20 - 120	C_1	5Y 6/2	54	2.5 YR 3/6 5Y 6/2	10	Silt Loam	3	0	Strong	Firm	
-											
-											
-											
-											

Test Pit Termination Depth (in.): 132 **Reason for Termination:** Target depth achieved

Groundwater Observations:				**In-Situ Testing:**			
Depth to water weeping from pit face (in.):	78			Percolation Test:	Not performed	Depth (in.):	N/A
Depth to standing water in hole (in.):	120	Stabilization Time:	~20 Minutes	Permeameter Test:	Not performed	Depth (in.):	N/A
Depth to estimated seasonal high groundwater [ESHGW] (in.):	54	Basis for ESHGW:	Redoximorphic features	Falling Head Test:	Yes	Depth (in.):	30
				Other Test:	Not performed	Depth (in.):	N/A

Additional Notes:
1.) N/A= Not Applicable

Deep Observation Hole

Site Name:	Carver, Massachusetts	Date:	12/22/2020
Site Address:	Montello Street	Time:	12:45
Project No.:	4250.03		
Ground Surface Elev. (ft.):	81.5	Weather :	Sunny, 30s-40s

SANBORN HEAD

Test Pit Number: TP3

Logged by: J. McCarthy/Q. Pratt
Soil Evaluator #: N/A
Signature: N/A

Depth (inches)	Soil Horizon or Layer	Soil Matrix Color (Moist)	Redoximorphic Features			Soil Texture (NRCS)	Coarse Fragments (% by Volume)		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles			
0 - 2	O	10YR 4/2	-	-	-	Loamy Sand	-	-	-	-	
2 - 8	A_P	10YR 4/2	-	-	-	Sandy Loam	<5	0	Weak	Firable	
8 - 16	B	10YR 5/6	-	-	-	Sandy Loam	<5	0	Weak	Friable	
16 - 48	C_1	10YR 4/4	42	2.5YR 3/6 5Y	5	Gravelly Loamy Sand	25	0	Weak	Friable	See Note 2
48 - 108	C_2	5Y 6/2	48	2.5YR 3/6 5Y	5	Sandy Loam	<5	0	Moderate	Friable	See Note 3
-											

Test Pit Termination Depth (in.): 108 **Reason for Termination:** Target depth achieved

Groundwater Observations:				**In-Situ Testing:**			
Depth to water weeping from pit face (in.):	48			Percolation Test:	Not performed	Depth (in.):	N/A
Depth to standing water in hole (in.):	100	Stabilization Time:	~20 Minutes	Permeameter Test:	Not performed	Depth (in.):	N/A
Depth to estimated seasonal high groundwater [ESHGW] (in.):	42	Basis for ESHGW:	Redoximorphic features	Falling Head Test:	Not performed	Depth (in.):	N/A
				Other Test:	Not performed	Depth (in.):	N/A

Additional Notes:

1.)N/A= Not Applicable

2.) Increase in Gravel fragments observed in the C1 layer between 36 and 48 inches below ground surface.

3.) Unable to perform falling head test due to saturation of the C2 layer. Test pit filled with water above C3.

Deep Observation Hole

Site Name:	Carver, Massachusetts	Date:	12/22/2020
Site Address:	Montello Street	Time:	11:00
Project No.:	4250.03		
Ground Surface Elev. (ft.):	81.5	Weather :	Sunny, 30s-40s

SANBORN HEAD

Test Pit Number: TP4

Logged by: J. McCarthy/Q. Pratt
Soil Evaluator #: N/A
Signature: N/A

Depth (inches)	Soil Horizon or Layer	Soil Matrix Color (Moist)	Redoximorphic Features			Soil Texture (NRCS)	Coarse Fragments (% by Volume)		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles			
0 - 4	O	10YR 4/2	-	-	-	Loamy Sand	-	-	-	-	
4 - 10	A_P	10YR 4/2	-	-	-	Sandy Loam	<5	0	Weak	Loose	
10 - 20	B	10YR 5/6	-	-	-	Sandy Loam	<5	0	Weak	Loose	
20 - 28	C_1	5Y 6/2	-	-	-	Extremely Gravelly Loamy Sand	60	0	Weak	Loose	
28 - 114	C_2	5Y 6/2	48	2.5YR 3/6 5Y 6/2	10	Sandy Loam	10	0	Strong	Soft	
-											
-											

Test Pit Termination Depth (in.): 114 **Reason for Termination:** Target depth achieved

Groundwater Observations:				**In-Situ Testing:**			
Depth to water weeping from pit face (in.):	48			Percolation Test:	Not performed	Depth (in.):	N/A
Depth to standing water in hole (in.):	50	Stabilization Time:	~ 20 Minutes	Permeameter Test:	Not performed	Depth (in.):	N/A
Depth to estimated seasonal high groundwater [ESHGW] (in.):	48	Basis for ESHGW:	Redoximorphic features	Falling Head Test:	Yes	Depth (in.):	36
				Other Test:	Not performed	Depth (in.):	N/A

Additional Notes:
1.)N/A= Not Applicable

ATTACHMENT D

LIMITATIONS

ATTACHMENT F
LIMITATIONS

Explorations

1. The analyses, recommendations, and designs submitted in this memorandum are based in part on the data obtained from subsurface explorations by Sanborn Head. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this memorandum.

2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and have been developed by interpretation of widely spaced explorations and samples; actual soil and bedrock transitions may be more or less gradual than indicated. For specific information, refer to the subsurface exploration logs.

3. Water level readings have been made in the explorations at the times and under the conditions stated on the logs. These data have been reviewed and interpretations have been made in the text of this memorandum. Please note that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors differing from those occurring at the time measurements were made.

Review

4. In the event that any changes in the nature, design, or location of the proposed buildings and site features are planned, the conclusions and recommendations contained in this memorandum shall not be considered valid unless the changes are reviewed and conclusions of the memorandum modified or verified in writing by Sanborn Head.

Construction

5. It is recommended that this firm be retained to provide soil engineering services during the excavation and earthwork construction phases of the work. This is to observe compliance with the design concepts, specifications, or recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

Use of Memorandum

6. This memorandum has been prepared for the exclusive use of Vanasse Hangen Brustlin, Inc. and its design consultants for the Route 58 and Montello Street roadway improvements, in accordance with generally accepted soil and foundation engineering practices.

7. This geotechnical and hydrogeologic engineering memorandum has been prepared for this project by Sanborn Head for design purposes only. Contractors using this memorandum to prepare a bid for site work acknowledge that its scope is limited to design considerations only.

ATTACHMENT E

MASSDOT STANDARD DRAWING

PIER FOUNDATIONS FOR 110 MPH WIND SPEED ZONE

SOIL TYPE	15' & 20' MAST ARMS				25' & 30' MAST ARMS				35' & 40' MAST ARMS				45' & 50' MAST ARMS				55' & 60' MAST ARMS			
	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS
DRY SAND (LOOSE)	3'–6"	8'–6"	18–#8	#5 @ 12"	3'–6"	9'–0"	18–#8	#5 @ 12"	3'–6"	11'–6"	18–#8	#5 @ 9"	4'–0"	12'–0"	18–#9	#5 @ 9"	4'–6"	13'–0"	18–#10	#5 @ 6"
DRY SAND (DENSE)	3'–6"	7'–6"	18–#8	#5 @ 12"	3'–6"	7'–6"	18–#8	#5 @ 12"	3'–6"	8'–6"	18–#8	#5 @ 9"	4'–0"	9'–0"	18–#9	#5 @ 9"	4'–6"	9'–6"	18–#10	#5 @ 6"
WET SAND (LOOSE)	3'–6"	9'–6"	18–#8	#5 @ 12"	3'–6"	11'–6"	18–#8	#5 @ 12"	3'–6"	14'–6"	18–#8	#5 @ 9"	4'–0"	15'–6"	18–#9	#5 @ 9"	4'–6"	16'–6"	18–#10	#5 @ 6"
WET SAND (DENSE)	3'–6"	8'–6"	18–#8	#5 @ 12"	3'–6"	9'–0"	18–#8	#5 @ 12"	3'–6"	10'–6"	18–#8	#5 @ 9"	4'–0"	11'–6"	18–#9	#5 @ 9"	4'–6"	12'–0"	18–#10	#5 @ 6"
CLAY (SOFT TO MEDIUM STIFF)	3'–6"	12'–0"	18–#8	#5 @ 12"	3'–6"	12'–0"	18–#8	#5 @ 12"	3'–6"	13'–0"	18–#8	#5 @ 9"	4'–0"	14'–0"	18–#9	#5 @ 9"	4'–6"	15'–6"	18–#10	#5 @ 6"
CLAY (STIFF)	3'–6"	10'–6"	18–#8	#5 @ 12"	3'–6"	10'–6"	18–#8	#5 @ 12"	3'–6"	11'–0"	18–#8	#5 @ 9"	4'–0"	12'–0"	18–#9	#5 @ 9"	4'–6"	13'–6"	18–#10	#5 @ 6"

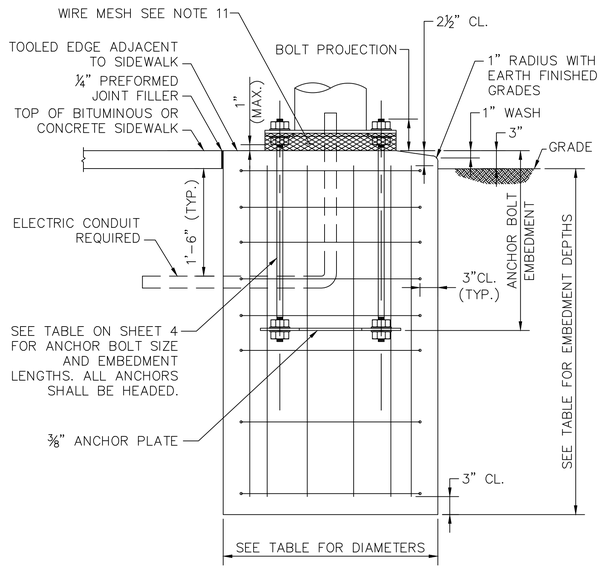
PIER FOUNDATIONS FOR 130 MPH WIND SPEED ZONE

SOIL TYPE	15' & 20' MAST ARMS				25' & 30' MAST ARMS				35' & 40' MAST ARMS				45' & 50' MAST ARMS				55' & 60' MAST ARMS			
	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS	DIAMETER	DEPTH	VERT. BARS	TIE BARS
DRY SAND (LOOSE)	3'–6"	10'–0"	18–#8	#5 @ 12"	3'–6"	10'–6"	18–#8	#5 @ 12"	3'–6"	13'–6"	18–#8	#5 @ 8"	4'–0"	14'–6"	18–#9	#5 @ 6"	4'–6"	15'–6"	18–#10	#5 @ 5"
DRY SAND (DENSE)	3'–6"	8'–6"	18–#8	#5 @ 12"	3'–6"	9'–0"	18–#8	#5 @ 12"	3'–6"	10'–0"	18–#8	#5 @ 8"	4'–0"	11'–0"	18–#9	#5 @ 6"	4'–6"	11'–6"	18–#10	#5 @ 5"
WET SAND (LOOSE)	3'–6"	11'–6"	18–#8	#5 @ 12"	3'–6"	13'–6"	18–#8	#5 @ 12"	3'–6"	17'–0"	18–#8	#5 @ 8"	4'–0"	18'–6"	18–#9	#5 @ 6"	4'–6"	19'–6"	18–#10	#5 @ 5"
WET SAND (DENSE)	3'–6"	10'–0"	18–#8	#5 @ 12"	3'–6"	10'–0"	18–#8	#5 @ 12"	3'–6"	12'–6"	18–#8	#5 @ 8"	4'–0"	13'–6"	18–#9	#5 @ 6"	4'–6"	14'–6"	18–#10	#5 @ 5"
CLAY (SOFT TO MEDIUM STIFF)	3'–6"	12'–6"	18–#8	#5 @ 12"	3'–6"	13'–0"	18–#8	#5 @ 12"	3'–6"	14'–0"	18–#8	#5 @ 8"	4'–0"	16'–0"	18–#9	#5 @ 6"	4'–6"	17'–6"	18–#10	#5 @ 5"
CLAY (STIFF)	3'–6"	11'–0"	18–#8	#5 @ 12"	3'–6"	11'–0"	18–#8	#5 @ 12"	3'–6"	12'–0"	18–#8	#5 @ 8"	4'–0"	13'–0"	18–#9	#5 @ 6"	4'–6"	14'–0"	18–#10	#5 @ 5"

BASIS OF DESIGN

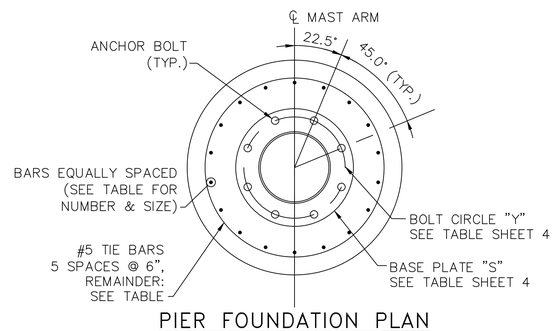
ALL MAST ARM STRUCTURES AND FOUNDATIONS ARE DESIGNED IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, SIXTH EDITION 2013, AND THE FOLLOWING PARAMETERS:

OVERTURNING DESIGN	FOUNDATIONS ARE SIZED TO RESIST OVERTURNING ACCORDING TO BROMS' DESIGN METHOD WITH A SAFETY FACTOR THAT INCLUDES AN OVERLOAD FACTOR OF 2.0 AND A SOIL UNDERSTRENGTH FACTOR OF 0.7.		
SOIL PARAMETERS		UNIT WEIGHT	FRICTION ANGLE
	LOOSE DRY SAND:	γ = 102 PCF	Φ = 33°
	DENSE DRY SAND:	γ = 116 PCF	Φ = 39°
	LOOSE WET SAND:	γ = 125 PCF	Φ = 33°
	DENSE WET SAND:	γ = 135 PCF	Φ = 39°
		UNIT WEIGHT	SHEAR STRENGTH
	SOFT TO MEDIUM STIFF CLAY:	γ = 113 PCF	S_U = 1.0 KSF
	STIFF CLAY:	γ = 120 PCF	S_U = 1.9 KSF
DEFLECTION LIMITS	MAXIMUM LATERAL DEFLECTION AT TOP OF MAST ARM FOUNDATION SHAFTS: $\frac{1}{2}$"		



PIER FOUNDATION DETAIL

NO SCALE



PIER FOUNDATION PLAN

NO SCALE

NOTES:

1. FOUNDATIONS SHALL BE 4000 PSI, 565 MASSDOT APPROVED MIX DESIGN.
2. FOUNDATIONS SHALL BE INSTALLED IN ACCORDANCE WITH MASSDOT STANDARD SPECIFICATIONS ITEM 945 – DRILLED SHAFTS
3. REINFORCEMENT SHALL BE ASTM A615 GRADE 60.
4. ANCHOR BOLTS SHALL BE SET BY TEMPLATE.
5. PROVIDE FOR ELECTRICAL CONDUIT.
6. EXCAVATION SHALL BE BY THE AUGER METHOD TO THE NEAT LINES OF THE OUTSIDE DIMENSION OF THE FOUNDATIONS WITHOUT DISTURBING THE SOIL AROUND AND BELOW THE PROPOSED FOUNDATION BOTTOM. ALTERNATE METHODS OF EXCAVATION MAY BE SUBMITTED TO MASSDOT FOR APPROVAL IF THEY MEET THE REQUIREMENTS LISTED IN NOTES 6, 7, AND 8.
7. THE EARTH WALLS OF THE FOUNDATION SHALL BE ADEQUATELY AND SECURELY PROTECTED AT ALL TIMES AGAINST CAVE–INS, DISPLACEMENT OF THE SURROUNDING EARTH AND FOR THE EXCLUSION OF GROUND WATER. THIS MAY BE DONE BY THE USE OF STEEL CYLINDER LINERS OR CASINGS THAT ARE APPROVED BY MASSDOT. IF LINERS ARE USED THEY MAY BE RECLAIMED PROVIDED THAT THEY ARE WITHDRAWN AS THE CONCRETE IS BEING PLACED, MAINTAINING A SUFFICIENT HEAD OF CONCRETE WITHIN THE LINER TO PREVENT REDUCTION IN THE FOUNDATION DIAMETER AND TO PREVENT EXTRANEOUS MATERIAL FROM FALLING IN FROM THE SIDES AND MIXING WITH THE CONCRETE.
8. IF THE SOIL IS DISTURBED OR REMOVED BEYOND THE NEAT LINES OF THE OUTSIDE DIMENSION OF THE FOUNDATION, IT SHALL BE REPLACED WITH CONCRETE. ANY ADDITIONAL COST FOR THE CONCRETE SHALL BE PAID FOR BY THE CONTRACTOR.
9. SPECIAL CARE SHOULD BE GIVEN TO AREAS WHERE WET SOIL IS ENCOUNTERED, TO INSURE THAT THE PREAUGERED HOLE DOES NOT COLLAPSE. THIS MAY REQUIRE THE USE OF STEEL CYLINDER LINERS OR CASINGS TO HOLD THE SOIL IN PLACE UNTIL READY FOR CONCRETE PLACEMENT, UPON APPROVAL FROM THE MASSDOT. THE STEEL CYLINDERS OR CASINGS SHALL BE WITHDRAWN AS THE FOUNDATION CONCRETE IS PLACED.
10. IF LEDGE OR UNSUITABLE SOIL IS ENCOUNTERED (i.e. ONE WHICH DOES NOT APPLY TO THE DESIGN TABLES SHOWN ON THIS SHEET), AN ALTERNATIVE DESIGN SHALL BE PROVIDED BY THE DESIGN ENGINEER. IF UTILITIES OR OTHER UNDERGROUND OBSTRUCTIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL BACKFILL THE AREA TO ITS ORIGINAL CONDITION UNTIL AN ALTERNATE DESIGN HAS BEEN PROVIDED BY THE DESIGN ENGINEER AND APPROVED BY MASSDOT. SPECIAL FOUNDATIONS SHALL BE DESIGNED IN ACCORDANCE WITH BASIS OF DESIGN TABLE ABOVE.
11. A GALVANIZED WIRE MESH SCREEN SHALL BE INSTALLED AT BASE OF POLE. SCREEN SHALL BE PRESS–FORMED OF 3 OR 4 MESH, 21 GAGE OR HEAVIER, STAINLESS STEEL OR HOT DIPPED GALVANIZED WIRE SCREEN OR APPROVED EQUIVALENT. SCREEN SHALL BE SCREWED INTO POLE BASE PLATE, AND SHALL BE FLUSH WITH THE TOP OF THE PIER FOUNDATION.
12. SANDY SOILS WITH STANDARD PENETRATION VALUES GREATER THAN 20 BLOWS PER FOOT SHALL BE CLASSIFIED AS DENSE DRY SAND AND DENSE WET SAND. SANDY SOILS WITH STANDARD PENETRATION VALUES RANGING FROM 6 TO 20 BLOWS PER FOOT SHALL BE CLASSIFIED LOOSE DRY SAND AND LOOSE WET SAND. SANDY SOILS WITH FEWER THAN 6 BLOWS PER FOOT SHALL REQUIRE SPECIAL FOUNDATION DESIGNS BY THE DESIGN ENGINEER AND APPROVED BY MASSDOT. SPECIAL FOUNDATIONS SHALL BE DESIGNED IN ACCORDANCE WITH BASIS OF DESIGN TABLE ABOVE.
13. CLAYS WITH STANDARD PENETRATION VALUES GREATER THAN 6 BLOWS PER FOOT SHALL BE CLASSIFIED AS STIFF CLAY. CLAYS WITH STANDARD PENETRATION VALUES RANGING FROM 2 TO 6 BLOWS PER FOOT SHALL BE CLASSIFIED AS SOFT TO MEDIUM STIFF CLAY. CLAYS WITH FEWER THAN 2 BLOWS PER FOOT SHALL REQUIRE SPECIAL FOUNDATION DESIGNS BY THE DESIGN ENGINEER AND APPROVED BY MASSDOT. SPECIAL FOUNDATIONS SHALL BE DESIGNED IN ACCORDANCE WITH BASIS OF DESIGN TABLE ABOVE.
14. A SANDY SOIL SHALL ONLY BE CLASSIFIED AS 'DRY' IF THE ENTIRE DRY SAND SHAFT LENGTH SITS ABOVE WET SOILS ACCORDING TO THE BORING LOGS. IF ANY PART OF THE SHAFT LENGTH IS CAST AT OR BELOW THE GROUNDWATER LEVEL, THE SOIL SHALL BE CLASSIFIED AS 'WET'.
15. WHERE THE PREDOMINATING SOIL TYPE IS INORGANIC SILT, THE SOIL SHOULD BE TREATED AS CLAY OR WET LOOSE SAND, WHICHEVER LEADS TO A MORE CONSERVATIVE FOUNDATION. INORGANIC SILTS WITH STANDARD PENETRATION N–VALUES LESS THAN 2 BLOWS PER FOOT, ORGANIC SILTS, AND PEAT SHALL REQUIRE SPECIAL FOUNDATION DESIGNS BY THE DESIGN ENGINEER AND APPROVED BY MASSDOT. SPECIAL FOUNDATIONS SHALL BE DESIGNED IN ACCORDANCE WITH BASIS OF DESIGN TABLE ABOVE.
16. WHERE FILL CONTAINS CLAY OR SILT, IT SHOULD BE TREATED AS SOFT CLAY.
17. MAST ARM FOUNDATIONS ARE DESIGNED TO SUPPORT MAST ARMS WITH OR WITHOUT OPTIONAL LUMINAIRE.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT FOUNDATION DIAMETER IS AT LEAST 17.5" GREATER THAN BOLT CIRCLE DIAMETER FOR ALL STRUCTURES
19. IN ORDER TO CREATE A FLUSH SURFACE, CONTRACTOR SHALL REFER TO THE FINAL ELEVATIONS SHOWN ON THE DESIGN PLANS WHEN INSTALLING FOUNDATIONS IMMEDIATELY ADJACENT TO OR WITHIN A SIDEWALK AREA.

MassDOT Massachusetts Department of Transportation Highway Division

STANDARD DRAWINGS

OVERHEAD SIGNAL STRUCTURE & FOUNDATION
MAST ARM CORED PIER FOUNDATIONS

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION
10 PARK PLAZA BOSTON, MASS

DECEMBER, 2015

ATTACHMENT F

BEARING RESISTANCE CALCULATIONS

PURPOSE:

Provide the factored bearing resistance for the Service and Strength Limit State in accordance with American Association of State Highway Officials (AASTHO) Load Factor and Resistance Design (LFRD) for the proposed Montello Street culvert foundations in Carver, Massachusetts

REFERENCES:

- AASHTO LRFD Bridge Design Specifications, Ninth Edition (2020)

ASSUMPTIONS

- The culvert is to be supported by 2-foot wide cast-in-place concrete strip footing(s) bearing on a 12-inch thick layer of 1.5-inch diameter crushed stone over the natural, inorganic, granular soil.
- Assumed geologic profile:

0'-6'	Fill
6'-10'	Organic Silty Sand (B2)
6'-22'	Sand & Silt

FACTORED BEARING RESISTANCE FOR 2-FEET WIDE FOOTINGS:

The factored bearing resistance at the Service and Strength Limit States are provided below. The bearing resistance at the Service Limit States was taken from Table 10.6.2.6.1-1 Presumptive Bearing Resistance for Spread Footing Foundations. The bearing resistance at the Strength Limit State was calculated in accordance with Article 10.5.5.1.

- Service Limit State - Table 10.6.2.6.1-1
  - Bearing resistance for fine to medium sand, silty or clayey medium to coarse sand (SW, SM, SC) = 2.0 kips per square foot (ksf)
  - Bearing Resistance Factor (φ_b) at the Service Limit State: 1.0
  - Factored bearing resistance ($q_r = \varphi b * q_n$): **1.0 * 2.0 ksf = 2.0 ksf**

- Strength Limit State - Article 10.6.3.1.2a – See attached calculations
  - Nominal Bearing Resistance (q_n) = 5.9 ksf
  - Bearing Resistance Factor (φ_b) at the Service Limit State: 0.45
  - Factored bearing resistance ($q_r = \varphi_b * q_n$): q_r = 0.45* 5.9 ksf = 2.6 ksf
  - Settlement Check (s_0)– Article 10.6.2.4.2-1:

Settlement (s_0) (inches)	Applied Load (q_0) (ksf)
0.25	0.8
0.50	1.5
0.75	2.3
1.00	3.0

  - Applied Load at 1.0 inch exceeds q_r at the Strength Limit State. Settlement Controls. Limit settlement to 0.75 inches.
  - **The factored bearing resistance at the Strength Limit State (q_r) = to 2.3 ksf**

CHECK MINIMUM REQUIREMENTS OF EXPLORATION POINTS

AASHTO Table 10.4.2.1: Minimum Number of Exploration Points and Depths for shallow foundations:

- Minimum Number: "For substructure widths, e.g. piers or abutments less than or equal to 100 ft, a minimum of one exploration per substructure."
  - Total substructure width = 33 ft.
  - Minimum number of borings required = 33ft/100ft = 1 (rounded up to nearest integer)
  - Number of borings performed = 2
  - Number of boring performed is greater than minimum required borings.
  - Minimum number of boring requirement met

- Minimum Depth of Explorations: "Depth of exploration should be at least to a depth where stress increase due to estimated foundation load is less than ten percent of the existing effective overburden stress at that depth."

  - Existing effective vertical overburden stress at bottom of boring (El. 57.5'):

    - For soil parameter and site condition see attached bearing resistance calculation.
    - Effective Stress = σ'_v (El. 57.5') = (γ * D_b) + (γ_{sat} – 62.4 pcf) * D_w
    - σ'_v (El. 57.5') = (120pcf * 5 ft) + (140pcf – 62.4 pcf) * 17 ft = 1919.2 psf

  - Applied effective vertical from footing (σ_v) :
    - q_o (Strength Limit State Bearing Resistance of the footing)= 2,300 psf
    - B (footing width) = 2 ft
    - D (depth of bottom of boring below footing) = 14 ft
    - Depth relative to footing width (B) = 14ft/2ft = 7B
    - Use Boussinesq Vertical Stress Contours for Continuous Footings

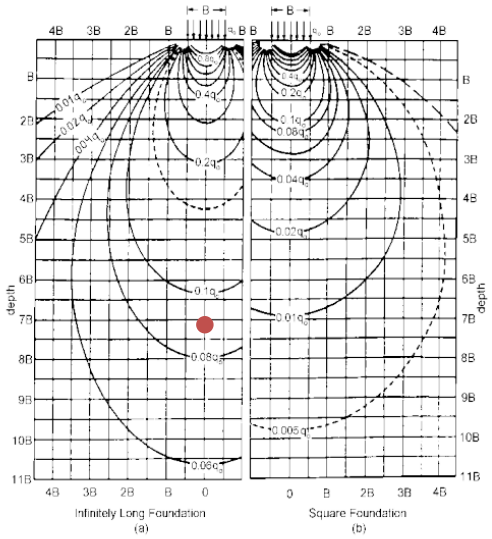


Figure 10.6.2.4.1-1—Boussinesq Vertical Stress Contours for Continuous and Square Footings Modified after Sowers (1979)

    - σ_{va} (@ 7B) = 0.09 q_o = .09 (2.3 ksf) = 0.21 ksf

- Check if σ_{va} is less than 10% of σ'_v
  - σ_{va} (@ 7B) = 0.21 ksf
  - 10% of σ'_v (El. 57.5') = 0.19 ksf
  - σ_{va} (@ 7B) > 10% of σ'_v (El. 57.5') Boring depth does not meet minimum requirements
- Assume a reduced Strength Limit State (q_r) of 2.0 ksf:
  - σ_{va} (@ 7B) = 0.09 q_o = .09 (2.0 ksf) = 0.18 ksf
  - 10% of σ'_v (El. 57.5') = 0.19 psf
  - σ_{va} (@ 7B) < 10% of σ'_v (El. 57.5') Boring depth meets minimum requirements

RESULTS:

Based on the sections above the factored bearing resistance at the Strength Limit State for the culvert's 2-foot wide cast-in-place concrete strip footings is controlled by the minimum requirement of the of the exploration point depth. The Strength and Service Limit State should be taken as follows:

- Factored bearing resistance at the **Service Limit State q_r = 2.0 ksf**
- Factored bearing resistance at the **Strength Limit State q_r = 2.0 ksf**

Objective: Calculate Strenght Limit State of the proposed culvert footings bearing on a one foot thick layer of crushed stone overlying undisturbed natural granular Silty Sand and estimate resutling settlement

References: AASHTO LFRD Bridge Design Specifications, Ninth Edition

Given: Fooring subgrade consists of undisturbed Silty Sand
Foundation is Rigid
Loads are applied normally to the bearing surface (vertical only) and not eccentrically.
Reduction Factor is based on an evaluation of a bridge (CIP) footing.

Soil Parameters			Reference
Soil description	Soil conditions below the footing are proposed to consist of 12-inch of 1.5-inch diameter crushed stone overlying loose to medium dense, brown, fine to medium Sand, trace to some Silt.		
Soil Unit Weight, γ	120	pcf	Assumed
Saturated Unit Weight, γ_{sat}	140	pcf	Assumed
Friction Angle, Φ_f	30	degrees	AASHTO Table 10.4.6.2.4-1
Undrained Shear Strenght, C	0	ksf	Assumed
Depth to Water, D_w	-3.5	feet	Calculated from Site Conditions
Modulus of Elasticity, Es	1.4	ksi	AASHTO Table C10.4.6.3-1
Poisson's Ratio, ν	0.25	dim	AASHTO Table C10.4.6.3-1
Modulus of Elasticity, Es	1.1	ksi	AASHTO Table C10.4.6.3-1
Poisson's Ratio, ν	0.25	dim	AASHTO Table C10.4.6.3-1
Avg N at El. 70'	8.5	blows	
σ'v @ El. 70'	0.988	ksf	NAVD - 88
C_N	1.24		AASHTO 10.4.6.2.4-1
N1	10.5	blows	AASHTO 10.4.6.2.4-1
N1,60	14.0	blows	AASHTO 10.4.6.2.4-3
Es	1.36	ksi	AASHTO Table C10.4.6.3-1

Site Conditions		
Footing Elevation:	71.5	ft, NAVD-88
Ground Surface (GS) Elevation:	79.5	ft, NAVD-88
Groundwater Elevation:	75	ft, NAVD-88

Foundation Parameters			Reference
Footing Length, L	33	feet	VHB Plans (assumption)
Footing Embedment Depth, D_f	4	feet	
Footing Eccentricity, e	0	feet	
Reduction Factor (dim)	0.45		AASHTO Table 10.5.5.2.2-1

Solution: Evaluate factored bearing resistance.

$$q_R = \varphi_b \, q_n$$ AASHTO 10.6.3.1.1-1

where q_R = Factored Bearing Resistance (ksf)
q_n = Nominal Bearing Resistance (ksf)
φ_b = Resistance Factor specified in Article 10.5.5.2.2

$q_n = cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5\gamma B N_{\gamma m} C_{w\gamma}$ AASHTO 10.6.3.1.2a-1

In which:

$$N_{cm} = N_c s_c i_c$$ AASHTO 10.6.3.1.2a-2

$$N_{qm} = N_q s_q d_q i_q$$ AASHTO 10.6.3.1.2a-3

$$N_{\gamma m} = N_\gamma s_\gamma i_\gamma$$ AASHTO 10.6.3.1.2a-4

where c = cohesion taken as undrained shear strength (ksf)
N_c = cohesion term bearing capacity factor
N_q = surcharge term bearing capacity factor
N_γ = unit weight term bearing capacity factor
γ = total unit weight of soil above or below the the bearing depth of the footing (kcf)
D_f = footing embedment depth (feet)
B = footing width (feet)
C_{wq}, $C_{w\gamma}$ = correction factors to account for the location of the groundwater table (dim)
s_c, s_γ, s_q = footing shape correction factors (dim)
d_q = correction factor to account for the shearing resistance along the failure surface pasing through the cohesionless material above the bearing elevation (dim)
i_c, i_γ, i_q = load inclination factors (dim)
D_w = depth to water surface taken from the ground surface

C_{wq}, $C_{w\gamma}$ AASHTO Table 10.6.3.1.2a-2

s_c, s_γ, s_q AASHTO Table 10.6.3.1.2a-3

Solution: Estimate allowable vertical stress (ksf) and resulting settlement at the Strength Limit State

$$S_e = \frac{(q_o * (1 - v^2) * \sqrt{A'})}{144 * E_s \beta_z}$$ AASHTO Eq. 10.6.2.4.2-1

where qo = applied vertical stress (ksf)
A' = effective area of footing (ft2)
Es = Young's Modulus of soil taken as specified in Article 10.4.6.3 if direct measurements of Es are not available from the results of in-situ or laboratory tests (ksi)
βz = shape factor taken as specified in Table 10.6.2.4.4-1 (dim)
v = Poisson's Ratio, taken as specified in Article 10.4.6.3 if direct measurements are not available from the results of in-situ or laboratory testing (dim)

Bearing Resistance Calculations:

Factored Bearing Resistance: $q_R = q_n * \varphi_b$

φ_b=		0.45		Table 10.5.5.2.2-1
B=		2.0	ft	
B'=		2.0	ft	
c =		0.0	ksf	
N_c =		30.1		Table 10.6.3.1.2a-l
N_q =		18.4		Table 10.6.3.1.2a-l
N_γ =		22.4		Table 10.6.3.1.2a-l
C_{wq} =		0.5		Table 10.6.3.1.2a-2
$C_{w\gamma}$ =		0.5		Table 10.6.3.1.2a-2
s_c =	1+(B/L)*(Nq/Nc) =	1.0		Table I 0.6.3 .1.2a-3
s_γ =	1 - 0.4 (B/L) =	1.0		Table I 0.6.3 .1.2a-3
s_q =	1+(B/L * tanΦ_f) =	1.0		Table I 0.6.3 .1.2a-3
d_q =		1.0		Table 10.6.3.1.2a-4
i_c =		1.0		Article 10.6.3.1.2a
i_γ =		1.0		Article 10.6.3.1.2a
i_q =		1.0		Article 10.6.3.1.2a
N_{cm} =	$N_c * s_c * i_c$ =	31.2		Equation 10.6.3.1.2a-2
N_{qm} =	$N_q * s_q * d_q * i_q$ =	19.0		Equation 10.6.3.1.2a-3
$N_{\gamma m}$ =	$N_\gamma * s_\gamma * i_\gamma$ =	21.9		Equation 10.6.3.1.2a-4
q_n =	$cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5\gamma B N_{\gamma m} C_{w\gamma}$	5.9	ksf	Equation 10.6.3.1.2a-1
q_r =	$\varphi_b * q_n$	2.6	ksf	AASHTO 10.6.3.1.1-1

Settlement Calculations:

B=		2.0	ft	
B'=		2.0	ft	
A =	L*B' =	66.0	ft^2	
β_z =		1.4		Table 10.6.2.4.4-1
Es =		1.1	ksi	AASHTO Table C10.4.6.3-1
q_{o-1} =	$144 S_o E_s \beta_z / [1-v^2) * A'^{(1/2)}]$			Equation 10.6.2.4.2-1

S_{o-1}	0.25	in	0.8	ksf	
S_{o-2}	0.5	in	1.5	ksf	
S_{o-3}	0.75	in	2.3	ksf	0.75 inches allowable settlment controls.
S_{o-4}	1.0	in	3.0	ksf	3.0 ksf exceeds Strenght Limit State

ATTACHMENT G

LABORATORY RESULTS

Client:	Sanborn, Head & Associates, Inc.				
Project:	Rte 58 & Montello St				
Location:	Carver, MA			Project No:	GTX-313019
Boring ID:	TP-2	Sample Type:	bag	Tested By:	ckg
Sample ID:	C1	Test Date:	01/12/21	Checked By:	bfs
Depth :	20-120 In	Test Id:	607709		
Test Comment:	---				
Visual Description:	Moist, olive gray sandy silt				
Sample Comment:	---				

USDA Textural Classification

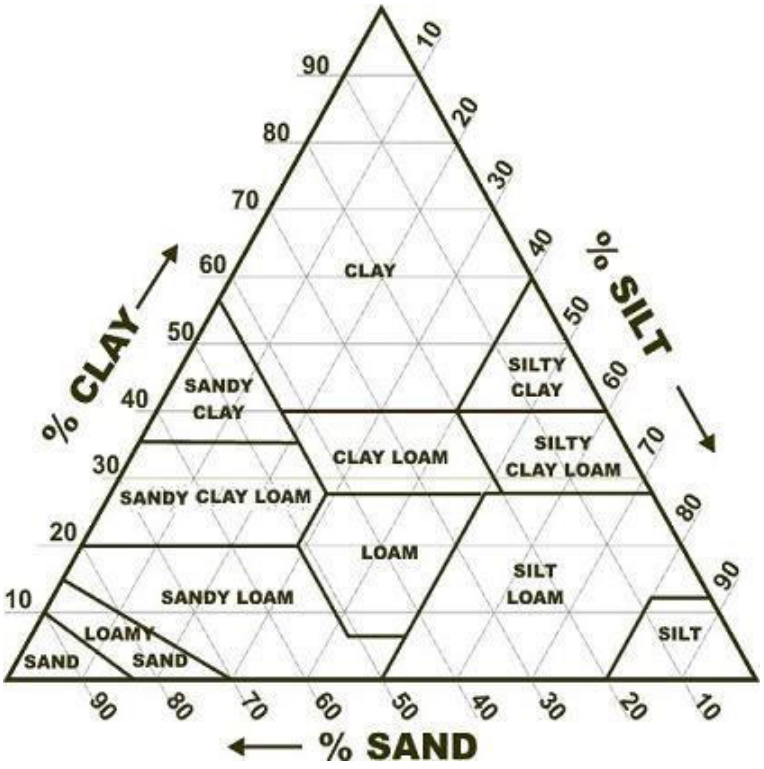
Boring ID	Sample ID	Depth	Sand, %	Silt, %	Clay, %	Classification
TP-2	C1	20-120 In	37	58	5	Silt Loam

Classifications based only on material passing the #10 sieve

Sand: material passing 2.0 mm and retained on 0.05 mm diameter

Silt: material passing 0.05 mm and retained on 0.002 mm diameter

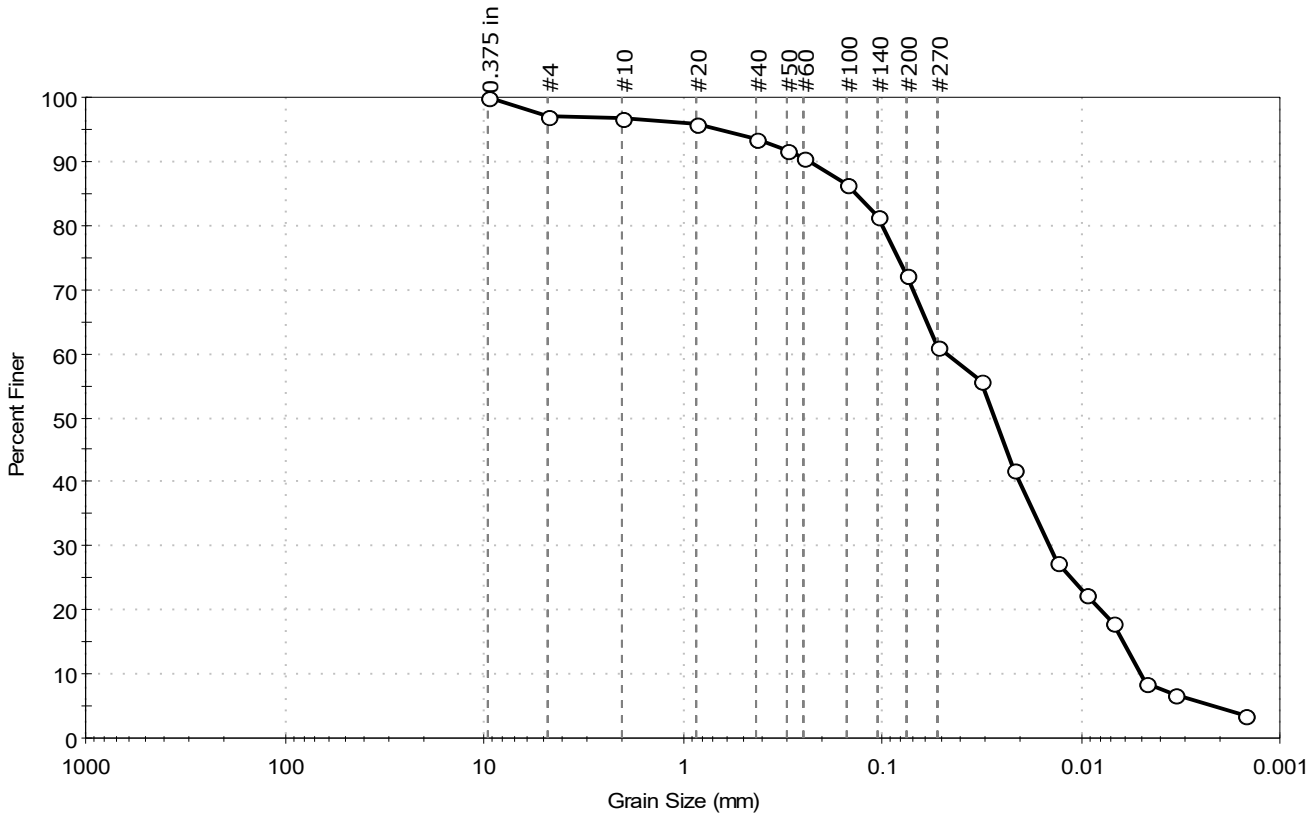
Clay: material passing 0.002 mm diameter



Client:	Sanborn, Head & Associates, Inc.				
Project:	Rte 58 & Montello St				
Location:	Carver, MA			Project No:	GTX-313019
Boring ID:	TP-2	Sample Type:	bag	Tested By:	ckg
Sample ID:	C1	Test Date:	01/11/21	Checked By:	bfs
Depth :	20-120 In	Test Id:	607707		

Test Comment: ---
Visual Description: Moist, olive gray sandy silt
Sample Comment: ---

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
–	2.9	24.8	72.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	97		
#10	2.00	97		
#20	0.85	96		
#40	0.42	94		
#50	0.30	92		
#60	0.25	91		
#100	0.15	86		
#140	0.11	82		
#200	0.075	72		
#270	0.053	61		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0320	56		
---	0.0218	42		
---	0.0131	27		
---	0.0095	22		
---	0.0068	18		
---	0.0048	9		
---	0.0034	7		
---	0.0015	3		

Coefficients

D_{85} = 0.1351 mm
D_{30} = 0.0143 mm
D_{60} = 0.0477 mm
D_{15} = 0.0061 mm
D_{50} = 0.0272 mm
D_{10} = 0.0050 mm
C_u = 9.540
C_c = 0.857

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

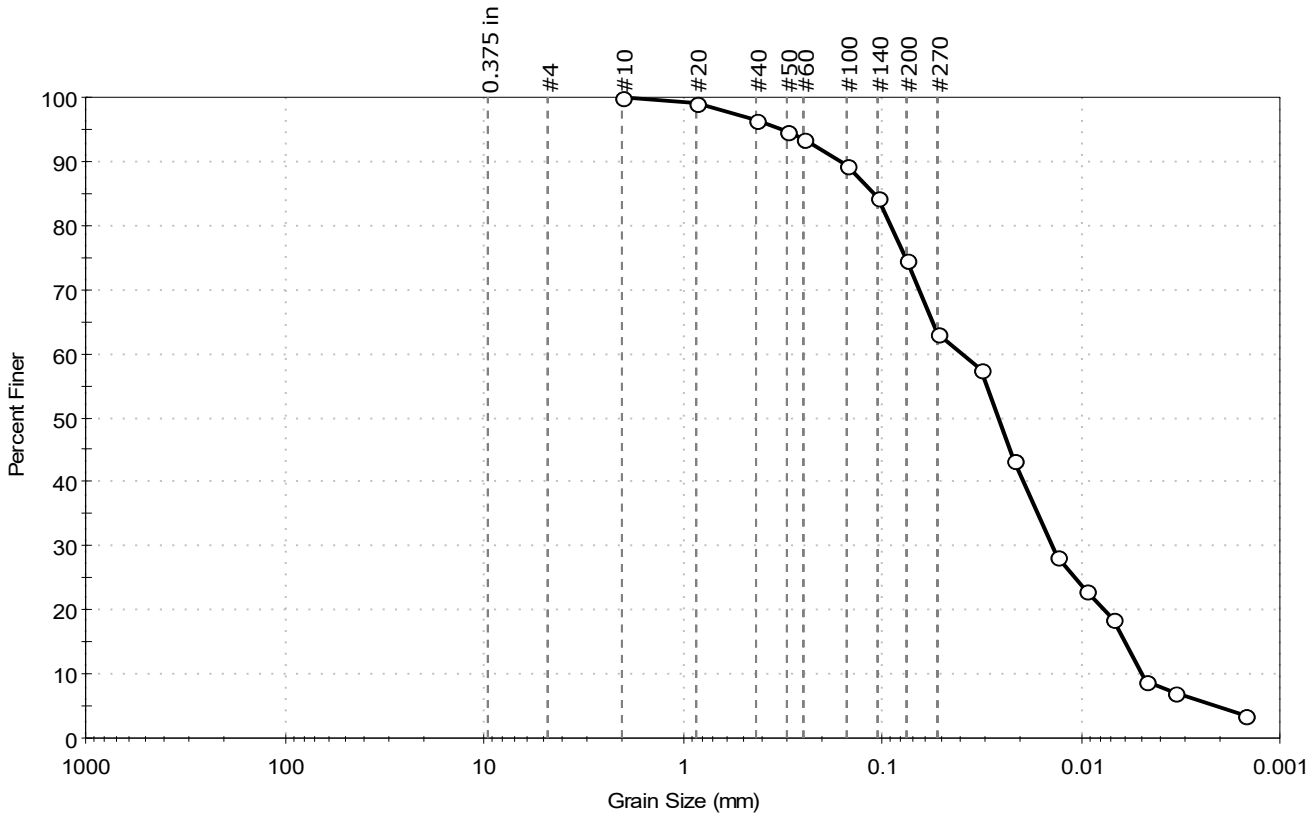
Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #270 Sieve

GeoTesting EXPRESS

Client:	Sanborn, Head & Associates, Inc.				
Project:	Rte 58 & Montello St				
Location:	Carver, MA			Project No:	GTX-313019
Boring ID:	TP-2	Sample Type:	bag	Tested By:	ckg
Sample ID:	C1	Test Date:	01/11/21	Checked By:	bfs
Depth :	20-120 In	Test Id:	607707		
Test Comment:	Only minus No. 10 sieve for USDA classification				
Visual Description:	Moist, olive gray sandy silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	25.3	74.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#10	2.00	100		
#20	0.85	99		
#40	0.42	97		
#50	0.30	95		
#60	0.25	94		
#100	0.15	89		
#140	0.11	84		
#200	0.075	75		
#270	0.053	63		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0320	58		
---	0.0218	43		
---	0.0131	28		
---	0.0095	23		
---	0.0068	19		
---	0.0048	9		
---	0.0034	7		
---	0.0015	4		

Coefficients

D_{85} =0.1117 mm	D_{30} =0.0138 mm
D_{60} =0.0396 mm	D_{15} =0.0060 mm
D_{50} =0.0260 mm	D_{10} =0.0050 mm
C_u =7.920	C_c =0.962

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #270 Sieve

Client:	Sanborn, Head & Associates, Inc.				
Project:	Rte 58 & Montello St				
Location:	Carver, MA			Project No:	GTX-313019
Boring ID:	TP-4	Sample Type:	bag	Tested By:	ckg
Sample ID:	C2	Test Date:	01/12/21	Checked By:	bfs
Depth :	28-114 In	Test Id:	607710		
Test Comment:	---				
Visual Description:	Moist, light olive brown sandy silt				
Sample Comment:	---				

USDA Textural Classification

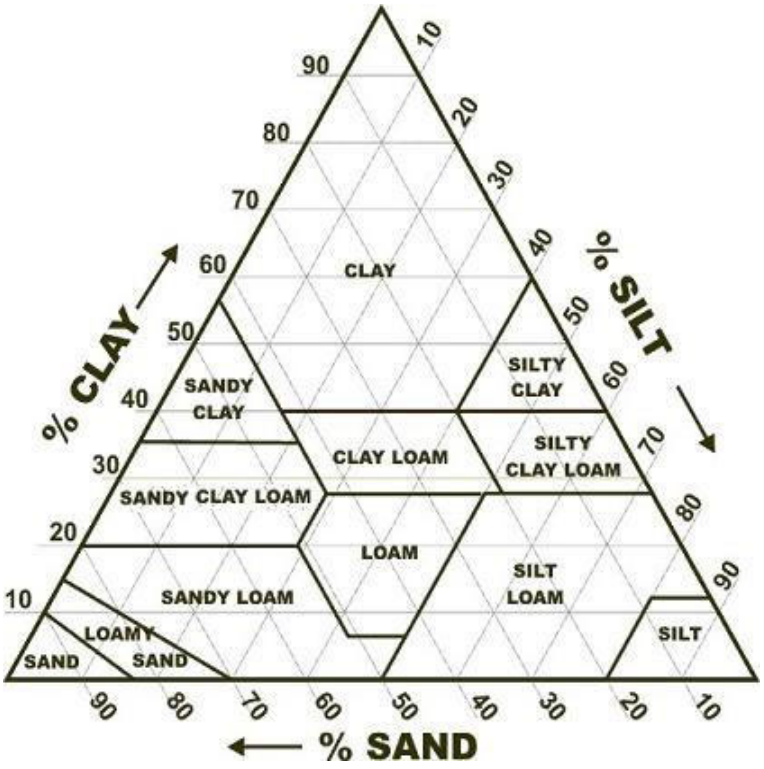
Boring ID	Sample ID	Depth	Sand, %	Silt, %	Clay, %	Classification
TP-4	C2	28-114 In	53	40	7	Sandy Loam

Classifications based only on material passing the #10 sieve

Sand: material passing 2.0 mm and retained on 0.05 mm diameter

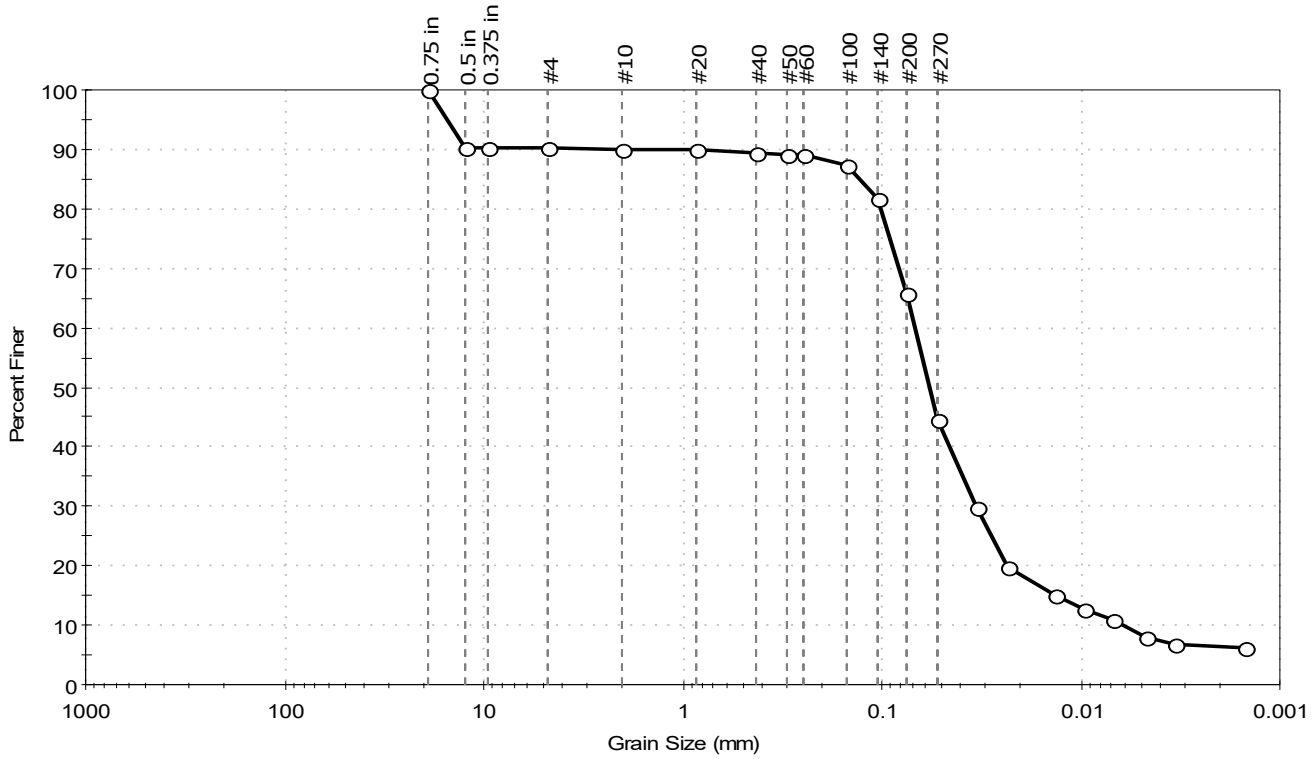
Silt: material passing 0.05 mm and retained on 0.002 mm diameter

Clay: material passing 0.002 mm diameter



Client:	Sanborn, Head & Associates, Inc.				
Project:	Rte 58 & Montello St				
Location:	Carver, MA			Project No:	GTX-313019
Boring ID:	TP-4	Sample Type:	bag	Tested By:	ckg
Sample ID:	C2	Test Date:	01/11/21	Checked By:	n/a
Depth :	28-114 In	Test Id:	607708		
Test Comment:	---				
Visual Description:	Moist, light olive brown sandy silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	9.7	24.5	65.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	90		
0.375 in	9.50	90		
#4	4.75	90		
#10	2.00	90		
#20	0.85	90		
#40	0.42	89		
#50	0.30	89		
#60	0.25	89		
#100	0.15	87		
#140	0.11	82		
#200	0.075	66		
#270	0.053	44		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0334	30		
---	0.0235	20		
---	0.0135	15		
---	0.0096	13		
---	0.0070	11		
---	0.0047	8		
---	0.0034	7		
---	0.0015	6		

Coefficients

D_{85} = 0.1300 mm D_{30} = 0.0335 mm

D_{60} = 0.0682 mm D_{15} = 0.0135 mm

D_{50} = 0.0580 mm D_{10} = 0.0061 mm

C_u = 11.180 C_c = 2.698

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

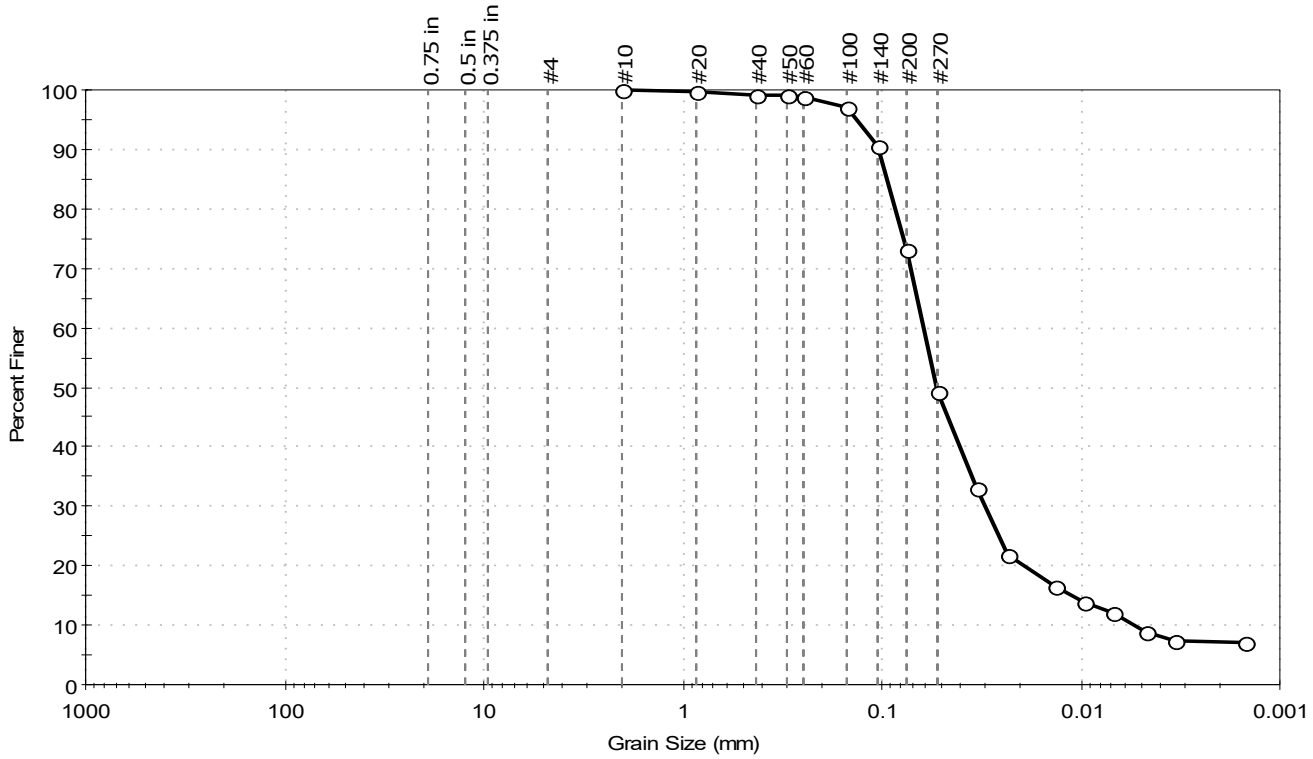
Est. Specific Gravity : 2.65

Separation of Sample: #270 Sieve

GeoTesting EXPRESS

Client:	Sanborn, Head & Associates, Inc.				
Project:	Rte 58 & Montello St				
Location:	Carver, MA			Project No:	GTX-313019
Boring ID:	TP-4	Sample Type:	bag	Tested By:	ckg
Sample ID:	C2	Test Date:	01/11/21	Checked By:	n/a
Depth :	28-114 In	Test Id:	607708		
Test Comment:	Only minus No. 10 sieve for USDA classification				
Visual Description:	Moist, light olive brown sandy silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	26.9	73.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#50	0.30	99		
#60	0.25	99		
#100	0.15	97		
#140	0.11	91		
#200	0.075	73		
#270	0.053	49		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0334	33		
---	0.0235	22		
---	0.0135	17		
---	0.0096	14		
---	0.0070	12		
---	0.0047	9		
---	0.0034	7		
---	0.0015	7		

Coefficients

D_{85} = 0.0949 mm	D_{30} = 0.0303 mm
D_{60} = 0.0620 mm	D_{15} = 0.0110 mm
D_{50} = 0.0536 mm	D_{10} = 0.0054 mm
C_u = 11.481	C_c = 2.742

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #270 Sieve

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